



FRIDAY, DECEMBER 10, 1897.

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Contributions.

Heavy Rails and Smooth Track.

ST. LOUIS, Dec. 5.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I read Chief Engineer's letter on heavier rail sections [see last week's issue] and do not think there can be any doubt that the heavier rail is an improvement in the riding of track, and is a step in the right direction for all railroads with heavy traffic.

Our American railroads, as we all know, have been very cheaply constructed; there are many good reasons why they were so built, but the country is now getting older and larger, and the increase of population and business brings heavier traffic, and the railroads must prepare for carrying it. And, further, we must economize in expenses and reduce in the rates.

I have contended for a number of years that heavier rail is an important factor when we consider that in the maintenance of way expenses of a railroad the labor is just about one-half of the total expenses, including rails, ties, ballast, bridges, buildings, roadbed, etc.; the rails are an item of a little less than eight per cent. It is apparent from this that to economize we can more readily save eight per cent. in the cost of labor than we can save eight per cent. in the cost of rails, and if we can save eight per cent. in the cost of labor we pay for the rails.

Now, it is further apparent that a light rail requires more labor; I think it can be clearly proved that it requires more than eight per cent. additional labor to keep up a light rail with the proper surface than to keep up a heavy rail; that is, I would say from 60, 70 and 75 lbs. per yard, compared with 100 lbs. per yard, so that you can see the importance of a heavy rail from a financial standpoint.

As to the question of "softness of track," I think the heavy rail will be kept in better surface, and the car-builders will adjust their springs so that the elasticity for the coach will be found to supply the difference between the "softness" of the light rail and the "stiffness" of the heavy rail, if such a condition exists, as is complained of by the writer; it may be noticeable, but not to any marked degree between the two weights of rails.

M. OF WAY.

M. OF WAY.

Amber-Colored Glass for Night Signals.

PHILADELPHIA, Dec. 1, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with interest the editorial in your issue of November 26 on the subject of colors for night fixed signals, but I notice that you say nothing about the use of amber for the caution indication in distant signals. You seem to have abandoned amber in favor of the scheme for using white for caution. It seems to me that we have got to use amber in order to meet the objections mentioned in your second paragraph on distant signals. If we use white for anything except all-clear we shall have a long contest with the older superintendents, with all who have been trainmen or who sympathize with trainmen now, and with all the old fogies. It is true that white is a better light than amber. It is also true that on cabooses white lights might easily be arranged to be used for the same indications that green now gives, and it would be equally easy to change the lights on the front of locomotives, making green indicate an extra train and white indicate that a second section of the same regular train would follow; but it will take a long time to bring about this change.

On the other hand, amber will meet the views of the objectors and please both sides. While calling it amber,

we can make it light enough for all practical purposes. For that matter, many so-called white lights are very much like yellow. If anybody is inclined to look upon this proposal as a species of double dealing, he may be assured that in two years after the general adoption of amber all good judges who shall have watched the progress of events will be wondering why we ever made so much fuss over so small a thing.

It is needful to take care and not require too much of our white lights. In using green for all-clear, we propose to make white indicate danger, so as to provide for the contingency of a broken colored glass. This is all right, but we can hardly require engineers to treat every white light as a danger indication, for on some roads night trains would have to be run at cautionary speed half the time on account of the innumerable street and house lights which come within the range of signals. The requirement to look upon white as danger must therefore be limited to fixed signals. But in some situations the mere location of a distant signal is not enough to differentiate it, as much as is desirable, from surrounding non-signal lights, and a more distinctive tint is needed. Amber may be called a varied tint of the common oil lamp flame. By employing this expedient and by making the signal light larger than most other lights we may have two features in the distant signal going to make it distinctive, while still retaining practically all the simplicity asked for by the advocates of white.

We must remember that enginemen are becoming every year better trained to the habit of requiring a positive signal to proceed, instead of depending, as of old, on the absence of a danger signal. When we have adopted green for go-ahead this improved habit will be acquired faster, and so the importance of all these fine-spun theories about white for danger and about the relative distinctiveness of different danger or caution colors will constantly grow less. P.

P

Bridging the North River.

NEW YORK, Dec. 1, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The conservatism of capital has never been more strikingly exhibited than in the persistency with which projects for bridging the North River are promulgated. Why such schemes find more favor than what seems to the writer to be the very much more feasible plan, the tunnel, is a mystery.

As your readers are most of them aware, two bridges have been proposed to cross the Hudson, several miles uptown, each to cost from \$20,000,000 to \$30,000,000, exclusive, I believe, of real estate and terminals, and this to give a very doubtful kind of service. To approach the bridge on the Jersey side would mean a long climb, occupying not less than 10 minutes; crossing the bridge and to descend the long grade into the New York terminal would require another 15 minutes. From here another means of transit would have to be taken to reach the business center, occupying 25 minutes—total time from Jersey City to New York business center, 50 minutes. To accommodate all the steam roads in the terminal on Manhattan Island would require real estate of such a fabulous value as to kill any possible chance of financial success.

The only commercially feasible way of dealing with the Jersey terminal problem would be to have an independent rapid transit service tapping the Jersey City terminals at one or more convenient points of junction, and running through a tunnel direct to the business center of New York, as the Brooklyn Bridge does for Brooklyn. As the make-up of overland steam trains does not lend itself to rapid transit, it follows that trans-river service would have to be of some modern system of car propulsion, such as the electric motor would afford. Given, therefore, a rapid transit electric system, running shuttle trains from the New York business center to a grand junction in Jersey City, it can be shown that a tunnel possesses such great advantages over the bridge as to leave no question as to which would be the better means of crossing the river.

Such a rapid transit system in a tunnel requires no more room, even at terminals, than can be obtained under a city street. Leaving out the matter of real estate, such a tunnel could be built for \$5,000,000, as against \$25,000,000, or more likely \$50,000,000, for the bridge. It would in a large degree be a gravity road, the reverse of the bridge in this respect. The trip could be easily made in five minutes, instead of 50 minutes as with the bridge, and a commutation rate of three cents per passenger would be profitable. For a large part of the passengers, no other means of transit would have to be employed after reaching New York. The question whether 10 cents a day more must be paid to some local street line in New York City is a serious one to the commuters.

The trouble with these proposed bridges is that, like the old Hudson River tunnel, they are designed with the idea that the New York business center is moving northward. There was some excuse for this idea in 1873, the time of the projection of the Hudson River tunnel, but the completion of the Brooklyn Bridge and elevated railroads, the discovery of the art of building sky-scrapers, and other causes, has changed this northward movement and even brought back to the vicinity of the City Hall and Wall street some concerns that had taken the initiative of moving to Union and Madison squares. To the writer's mind the chief cause of

the failure of the old Hudson River tunnel scheme was due to the fact that it was laid too far uptown to be of use to the commuter, and any trans-Hudson scheme that does not depend upon the commuter for nine-tenth of its business will be counting without its host. The long-distance travelers are comparatively few in number, have plenty of time, require elaborate terminal facilities, sleeping cars, baggage and express trains, etc., and must perforce be of secondary consideration in a real rapid transit scheme. Freight, of course, is out of the question; no rail communication could possibly equal the economy and adaptability of the present lighterage system. The fact that the Hudson River tunnel proposed to handle freight and intended to operate with steam locomotives, together with the fact that the northward course of New York business was checked, seems to explain why this tunnel has been so far from successful as a business enterprise. As it is, it stands nearly half completed, with an expenditure of not less than one and one-half millions. The St. Clair River tunnel, built under a stream the size of the Hudson, and under similar conditions, cost only \$2,500,000, with approaches and all.

With modern methods of tunneling, and modern means of propelling cars, bridges such as those proposed are engineering absurdities. A tunnel would cost one-fifth as much, could be built in one-half the time, would make the trip in one-tenth the time, would require one-fifth as much power to operate, would not impede or obstruct shipping, would run no risk of destruction in case of foreign bombardment, would occupy no valuable space on this island (where space is so precious), would give to the commuter a reasonable fare and to the investor a most liberal return, neither of which could the bridges possibly hope to do.

Now that we have proved that we can operate trains, moving on quick headway by electricity, with greater despatch and with greater economy than can be done with steam locomotives, the great objection to tunnels has disappeared. The art of tunneling, too, has improved so materially, that the cost is less than half of what it was 20 years ago. When these facts are properly realized by our engineers and capitalists, perhaps we will be able to go to our suburban homes without being crowded in a noisome ferry-boat, or compelled to hang on to a strap for the best part of an hour.

WALTER H. KNIGHT.

Valuation of Railroad Property for Local Taxation.

NEW YORK, Nov. 30, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A case has recently been decided by the Court of Appeals of this state, involving the question of what elements enter into the value of a railroad for purposes of local taxation which, it seems to me, should be of special interest to everyone interested in the ever-recurring problem of getting town and city assessors to place reasonable valuations on railroad property. It is the case of the people *ex rel. D. L. & W. v. Clapp*, 153 N. Y. 490, and the decision declares that the "cost of reproducing" the road is the maximum at which an assessment can be made by local assessors. Is not this a deliberate repudiation of the rule laid down in the well-considered case, barely ten years old, decided in the same court, of the people *ex rel. R., W. & O. v. Hicks*? (105 N. Y. 198).

This is not a matter of slight importance. There are many miles of railroad in this country—as, for instance, the trans-continental lines over the Rockies—that cost and could not be reproduced for one cent less than \$80,-000 a mile; and under the scheme for valuation announced by the Court of Appeals, a 40 mile stretch of such a roadway, through one of those western countries is about all the property that a board of assessors would need to find in order to secure all the money the county needed, as it would represent a taxable valuation of \$2,400,000. This decision directly antagonizes a Nevada case that was avowedly based upon the earlier New York decision, and which has been received by corporation interests the country over as a perfectly fair and just estimate of the taxable *quality*, based upon an equally fair and just estimate of the taxable *quantity*. That decision proceeds upon the well-recognized principle that no estimate of the value of any portion of the road can be intelligently made without some knowledge or information of it as a whole, and particularly of its *earning capacity* as a railroad, together with the state of its business and ordinary expenses. Certainly, in any view of the case, the earning capacity of a railroad should be the main consideration with county assessors in determining the taxable value. To exclude the earning capacity from consideration strikes at what most experts on the law of taxation will regard as a fundamental element. The principle involved in the decision comes up everywhere. Take the Central of New Jersey, for instance, practically running over a dead level. The cost of reproducing some parts of this road would be relatively trifling; but its earning capacity is great. But the Denver & Rio Grande, with such little items of construction as the Summit Pass and the Royal Gorge, has small earning capacity compared with the Jersey Central. Can this New York decision be applied in any way that will result in an equality of taxation as between different roads? Mr. Justice Brewer remarked in 154 U. S. 439 that “The rule of property taxation, is that the value of the property is the basis of taxation; the value of the property results from the use to which it is put, and varies with the

profitableness of that use." Did the court have this paragraph in mind when it decided the D. L. & W. case?

R. G. C.

[The foregoing statement overlooks the fact that the law in New York was materially changed between the time of the R. W. & O. and that of the D. L. & W. decision. The R. W. & O. case, which was decided in 1887, was based upon the assessment law in New York as it stood in 1880 and prior to that time. The theory of the law of 1880 included in one assessment not only the real estate but also the personal property and the franchises of the corporation. After 1880 a new theory came in vogue and has been developed until we have a state of law, on which the D. L. & W. case was decided, which is quite different from the law of 1880 and before. The law under which the assessment in the D. L. & W. case was made required an assessment to be made first, upon the franchises of the company; second, upon its personal property, and third upon its real estate. The first two assessments were made at the principal offices of the company in the state and the last assessment was made in the county where the real estate lay. It was the real estate assessment which was complained of in the D. L. & W. case and which the court decided to be erroneous, because it included the earning capacity of that branch of the railroad in the county. This could not be arrived at without taking into consideration not only the value of the personal property of the company, but also the value of its franchises, which were assessed elsewhere. The court therefore held that under the law as it stood at the time of the assessment simply the real estate of the company in the tax district should be assessed and not its other property (franchises and personalty), which was assessed elsewhere, and that the only way to determine the value of such real estate would be to consider the cost of reproducing the road at the time of the assessment. This was the contention of the railroad itself. The court distinctly called attention to the fact that the earlier decisions were inapplicable because based upon different statutes, and said that the decisions in other states could not be considered as authorities except in so far as they were based upon statutes similar to those in New York.—EDITOR RAILROAD GAZETTE.]

The Time-Extension of the Coupler Law.

The hearing before the Interstate Commerce Commission at Washington on the question of changing to a future date the time for compliance with the car coupler law was held in Washington on Dec. 1, 2 and 3, and the large hall of the Commission was crowded with railroad men, attorneys and spectators. On the first day Chairman Morrison first called for the arguments of the companies which had completely equipped their cars; and the Boston & Albany and the New York Central were represented respectively by Samuel Hoar and Frank Loomis. Mr. Hoar made a brief argument showing the utter paralysis of traffic which must follow if large roads were compelled to cease using cars of other roads. Mr. Loomis spoke in the same strain, stating that his road received every year from foreign roads a million freight cars, many of which are not equipped as required by the law.

Mr. John K. Cowen, one of the Receivers of the Baltimore & Ohio, appeared as spokesman for a committee which, he said, represented 600,000 cars. He said that 44½ per cent. of the freight cars of the country were now equipped with couplers and 36½ per cent. with airbrakes. He argued that this was sufficient evidence that the roads had made an honest effort to comply with the law. He offered as the principal reason why the roads had not complied fully, the industrial depression which followed the passage of the act of 1893, which, he said, had rendered them financially unable to make the outlay required by the law. He suggested an extension of five years, with a condition that 20 per cent. of the cars be equipped each year, and said that harsher terms by the Commission could only be met by the railroads through a reduction of wages.

Mr. Morrissey, Chief of the Brakemen's Brotherhood, protested against an extension of five years. The brotherhood convention, which had authorized Mr. Morrissey to appear, had voted against any extension at all. If wages were reduced, as Mr. Cowen suggested, the members of the brotherhood would meet the issue as best they could. Answering a question by the Chairman, the speaker said that his constituents believed that an extension of one year would be fair.

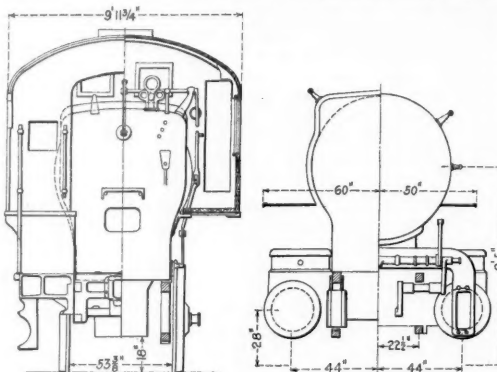
The Chicago Great Western presented an argument going to show that it had neither the facilities nor the financial resources to equip its cars within one year. Ex-Congressman Harrison, of Alabama, called attention to the severe strain put upon the Southern railroads by the yellow fever epidemic this year.

At the request of the Commission the representatives present gave estimates of the time in which they expected to be able to comply with the law.

On the second day Mr. Payson, for the Southern Pacific, proposed that the period within which common carriers shall comply with the provisions of the act be extended to Jan. 1, 1903, with the proviso that any car-

rier in default in whole or in part on Jan. 1, 1898, shall, during each calendar year thereafter, make good at least 20 per cent. of such default, or in default of such partial performance the provisions of the act shall be applicable to all cars of such carriers not properly equipped. All new cars to be properly equipped before use.

Several of the railroad representatives, notably Messrs. Payson, Cowen, of the Baltimore & Ohio, and Brown, of



Pennsylvania Class H-4 Engine.

the Chicago & Alton, asserted that the leaders of the trainmen's associations present at the hearing were not authorized to speak for the employees on their roads.

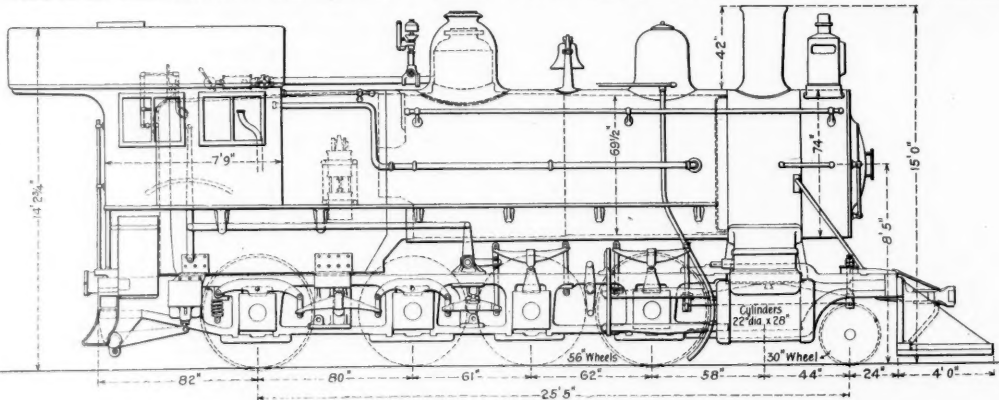
Among those who presented arguments at the second session in favor of the five years' extension of time were Mr. Thomas, of the Nashville, Chattanooga & St. Louis; Mr. Smith, of the Louisville & Nashville, and Mr. Ramsey, of the Wabash. A number of representatives from smaller roads which have made no attempt to equip their lines were also heard. Mr. Smith and Mr. Brown presented petitions from employees and Mr. Smith some from shippers, asking for an extension.

From testimony presented at the hearing it is estimated that the percentage of cars so old as to be not worth equipping is about 10. Figures furnished by Secretary Moseley showed the total number of cars owned by the roads which filed petitions for an extension to be 1,069,704, of which those owning 288,280 cars had between 75 per cent. and 100 per cent. of their cars equipped, those owning 394,312 cars had between 50 and 75 per cent. equipped, those owning 230,271 cars between 25 and 30 per cent. equipped, and those owning 156,841 cars below 25 per cent.

It was announced on Tuesday of this week that the Commission had decided to extend the time two years for the petitioning roads. The formal order and statement of reasons have not yet been prepared, but it is understood that the extension will be unconditional, and that the Commission will probably require quarterly or other periodical reports of progress by each road during the two-year period.

The New Consolidation Locomotive of the Pennsylvania.

The engravings show the general plan and end and side elevations of a consolidation locomotive recently designed and built for the Pennsylvania Lines West of Pittsburgh, which is known as the Class H-4 engine. Five of these are now in service and doing very good work on the lines between Pittsburgh and the Lake,



Pennsylvania Class H-4 Locomotive.

and five more are building at Altoona. We believe that the design in general was made at Fort Wayne, but naturally it must have had its final revision and approval at Altoona and in the office of the Chief of Motive Power. A table of general dimensions and other particulars follows:

PENNSYLVANIA CLASS H-4 LOCOMOTIVE—CONSOLIDATION.

No. of pairs of driving wheels.....	4
Diam. of driving wheels.....	56 in.
Size of driving axle journals.....	9 in. x 9½ in. x 10 in.
Length of driving wheel base.....	16 ft. 11 in.
Total wheel base of engine.....	25 ft. 5 in.
Total wheel base of eng. and tender.....	53 ft. 1½ in.
No. of wheels in engine truck.....	2
Diam. of wheels in engine truck.....	30 in.
Size of engine truck axle journals.....	5½ in. x 10 in.
Spread of cylinders.....	22 in. x 28 in.
Size of cylinders.....	22 in. x 28 in.
Steam ports.....	1½ x 21 in.
Exhaust ports.....	3 in. x 21 in.
Travel of valve.....	6 in.
Lap of valve.....	1 in.

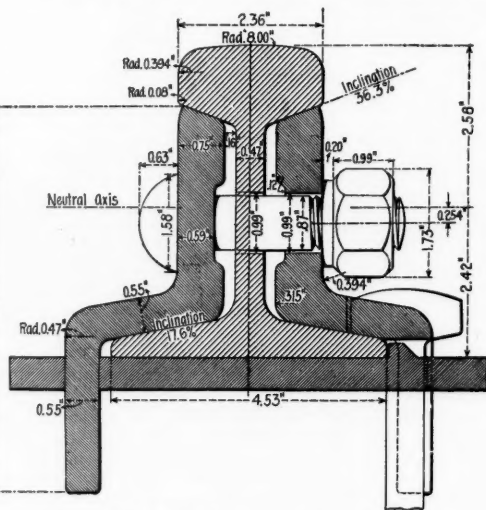
Type of boiler.....	Belpaire
Min. internal diam. boiler.....	68 in.
Number of tubes.....	316 or 263.
Outside diam. of tubes.....	2 in. or 2¼ in.
Length of tubes bet. tube sheets.....	11 ft.
Fire area through tubes, sq. ft.....	5.5 or 5.7
Size of firebox, inside.....	40 in. x 106 in.
Fire grate area, sq. ft.....	29.7
Ext. heating surface of tubes, sq. ft.....	2,516 or 2,168
Heating surface of firebox, sq. ft.....	151
Total heating surface of boiler, sq. ft.....	2,470 or 2,322
Steam pressure per square inch, lbs.....	185
No. of wheels under tender.....	8
Diam. of wheels under tender.....	34 in.
Size of tender truck axle journals.....	4¼ in. x 8 in.
Wt. on truck in working order, lb.....	8,210
Wt. on 1st pair of drivers, lb.....	36,400
Wt. on 2d pair of drivers, lb.....	39,870
Wt. on 3d pair of drivers, lb.....	40,100
Wt. on 4th pair of drivers, lb.....	39,100
Wt. of engine in working order, lbs.....	171,300
Wt. of tender loaded, lbs.....	92,600

Rails for the Eastern Chinese (Manchurian) Railroad.

We illustrate herewith the style of rail and fastenings which have been adopted for the railroad now building across Manchuria by a private company, under the auspices of the Russian government. Somewhat over 16,000 (English) tons of these rails have been ordered from the Druzhkovski Steel Works, South Russia, according to the Russian government specification, which in brief is essentially as follows:

Specifications.—The steel used must not contain more than 0.1 per cent. of either phosphorus or sulphur and not less than 0.4 per cent. of carbon. A sufficient amount of the head of each ingot, or of that end of the finished rail corresponding thereto, must be cut off to insure perfect soundness. The rail heads may be specially hardened, at the judgment of the works and with the consent of the receiving inspector.

The rails must be perfectly straight, free from warp



65-lb. Rail and Joint—Manchurian Railroad.

and of uniform section throughout the entire length; the inclined surfaces against which the fish-plates bear must be perfectly true and exact to requirement. The following toleration allowances are accorded: Two millimeters (0.079 in.) in width of flange. Five-tenths millimeter (0.02 in.) in the remaining dimensions.

The deviations from perfect symmetry with regard to the vertical axis are respectively 1 and 0.25 mm. (0.04 and

0.01 in.). The toleration allowances for rails of special section, such as are used in points and crossings, will be determined by the Minister of Ways and Communications in each particular case.

The rail ends must be cut square, the bolt holes drilled to gage and accurately spaced, with a toleration allowance of 1 mm. (0.04 in.) in either direction.

Rails 28 ft. long or less must be within 3 mm. (0.12 in.), more or less, of the prescribed length; for rails up to 35 ft. long, this allowance is increased to 4 mm. (0.16 in.); greater deviations will cause rejection of the rails.

The standard weight of the rails shall be determined by weighing 50 rails which conform to the issued drawings. After this determination, the weight is estimated by weighing at least 20 rails in every 1,000, to be chosen by the receiving inspector. Rails neither heavier nor lighter by 2.5 per cent. than the standard are accepted, if otherwise perfect; if the deficiency in weight exceeds

cooled rails will not be stronger than rails at a higher temperature. The rigid roadbed seems to be anticipated by the tremendous weight of the anvil which will sustain the rail under the drop test, and I shall have to hold, as theoretically and practically proved, that the denser the metal becomes by its contraction under low temperature, the stronger it becomes against sudden and slowly applied loads.

"I shall have to take issue with E. M. also that the fish-plates are of ample strength and stiffness compared with the rail. Although I have no dimensions of the fish-plate, the fact doubtless obtains with the Russian as well as with the American fish-plates, that they are not of ample strength and are too entirely devoid of elasticity to be used with the rail under consideration or with any rail.

"Doubtless the conditions which prevail in the tundras make the great separation of ties a necessity, so that the permanent way can be considered as of a very creditable nature only in view of the probable economy."

A rail maker calls attention to the fact that no mention is made of carbon above 0.4 or of the manganese. As to the variation in length, he says it is about half the allowance here and must require cold sawing, but the variation in weight is very liberal to the maker.

As to the requirement that rails must be free from surface defects, etc., he suggests that the Russians must be accustomed to cast-iron rails, and as to straightening them cold says "we think rails should be straightened when warm."

Concerning the test of plates, he considers that it would be a very poor plate that would not stand these tests, and finally says "these specifications are long enough to show the great wisdom of the professional engineer, but not so long but that pretty poor rails could be furnished under them."

Wright's Steel Freight Car Truck.

The engravings show a steel truck designed by Mr. R. C. Wright, a mechanical engineer of Philadelphia. It has been designed with special reference to replacing the standard diamond trucks on one of the great railroad systems of the country, but we are not yet at liberty to mention the name of that road. The construction is very obvious from the engravings. The transoms are made from commercial rolled channel beams, such as can be purchased in the market at any time. These are bent to a curve, as is done now with certain angle-iron tender frames. The sides are also of channel sections, but less weight per lineal foot than the transom channels. Between the ends of the transoms and the side channels are inserted the necks of cast-steel pedestals, which are riveted in place. Where the curves of the transoms meet the sides Z-shaped pieces are inserted for the purpose of transferring part of the weight of the load to the sides.

In the main elevation shown the pedestals and journal boxes are arranged for helical springs, four such springs each $3\frac{1}{2}$ in. in diameter, being placed over each box. Other views show the pedestals arranged in one instance for a double-coil helical spring, central over the journal box, and in the other for two elliptic springs on opposite sides of the pedestal. These latter are 26-in. centers, have five leaves and are 3 in. wide. Bolts unite the ends of these springs, one of them passing loosely through a slot in the frame. The weight of this truck frame will, of course, depend upon the services for which it is intended. For a car of 60,000 lbs. capacity it would not exceed 1,500 lbs., as only 28 lineal ft. of channel section are used in making the sides and transoms.

Reduction in Cost of Steam Power from 1870 to 1897.*

BY F. W. DEAN.

In the year 1870 the most economical steam engine in use in mills was the Corliss simple condensing engine, which used 19 or 20 lbs. of steam per horse-power per hour. Previous to that time compound engines had been used in England in mill practice, and simple engines had in many cases been changed to compound. In this country compound pumping engines had been used to a very limited extent, notably the Worthington direct-acting duplex compound, the first one

of which was put in at the Charlestown, Mass., water works in 1863, and the installation of the Morris engine at Lowell and the Leavitt engine at Lynn are well-known examples of them in the early part of the period which we are considering.

The Pawtucket pumping engine, built by George H. Corliss, and started on June 30, 1878, is another important example of economical pumping engines, and probably was the most economical steam engine which had been built up to that time, having used less than 14 lbs. of dry steam per indicated horse-power per hour. While these engines are not mill engines, they influenced the practice of builders of mill engines. . . . Of course, the greatest single step in economy was the introduction of the compound engine. At present we may cite the Louisville pumping engine and several mill engines, one or more at Grosvenor-Dale, Conn.; Natic, R. I.; West Boylston, Mass.; Berkley, R. I., and Lawrence, Mass., as being about on a par, and representing the best commercial economy.

In 1873 the most economical compound engines used about $16\frac{1}{2}$ lbs. of steam per indicated horse-power per hour, as shown by tests of the Lynn and Lawrence pumping engines, which then established new records for duty. Improvements in methods of using steam were made until it is now as easy to design an engine to use less than 13 lbs. of feed water per horse-power per hour as it was to use as little as 16 lbs. in 1875.

At this date steam jackets were common, and were used in all engines which gave the most economical performances. The steps, however, that lowered the steam consumption of compound engines from 16 lbs. to 14 lbs. per indicated horse-power per hour were largely the introduction of a cut-off on the low-pressure cylinder and a reheating receiver between the cylinders. Although the reheater was invented by the late E. A. Cowper, of London, in 1862, so far as I know, it was first used in this country by E. D. Leavitt in his engines for the Calumet & Hecla Mining Co., and is regarded by him as one of the most important causes of the economy of his engines.

These features appear to have been the principal means of lowering economy to 14 lbs. of steam; but to what are we to attribute the step to $13\frac{1}{2}$ lbs.? Clearance

be said of other causes, that most of the extreme cases of economy are those in which a good vacuum has been maintained. This leads me to say that the importance of good vacuums is often not appreciated, and that air pumps and condensers are as often too small.

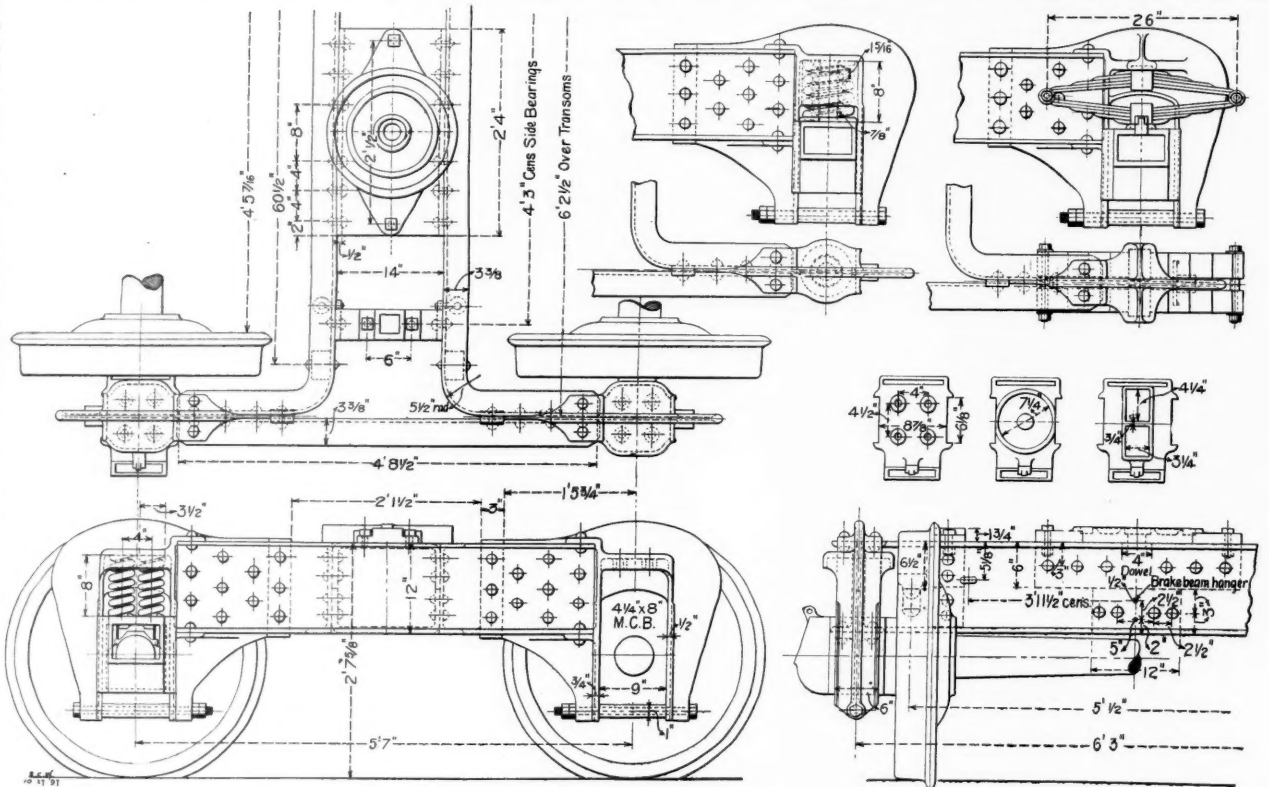
There is a strong tendency nowadays to underrate steam jackets, but I believe that in every case where they have been wasteful, or where their economy is indifferent, at all events with ordinary speeds, an examination would show that the jackets are air-bound, water-logged, blowing through traps, or that the jacket piping is bare, and thus steam for heating the building is charged to the engine. . . . The effect of reheaters in drying out steam which issues from a preceding cylinder and in superheating it to 60 degrees or 90 degrees, as is often the case, for use in the next cylinder, cannot be otherwise than advantageous. . . .

Considering economies effected, it is safe to say that, without including triple-expansion engines, steam economy has steadily decreased from 20 lbs. to $12\frac{1}{2}$ lbs. per indicated horse-power between 1870 and 1897. This corresponds to a saving of $37\frac{1}{2}$ per cent.

Within this period of 27 years the use of exhaust steam has extended in various mills, such as cotton, woollen and paper mills, so that in some mills the cost of steam power is next to nothing.

Economies of this kind are not confined to the use of the exhaust of non-condensing engines, for since 1895 the writer's firm has had installed at the Washington Mills, Lawrence, Mass., a large surface condensing vertical compound engine, the rejected heat of which is utilized. . . . The circulating water is sent from the condenser to the dye-house by the circulating pump at about the temperature required. The rejected heat of the engine is just as effectively used up as it would be if the engine were non-condensing and sending its exhaust to the dye-house. There are advantages, moreover, in the compound surface condensing engine, for there is less rejected heat to use, with consequent diminished chance for waste, and there is less heat lost by radiation from a pipe full of warm water than from one full of steam. This constitutes one of the latest forms of recent economies. . . .

What is there to be said concerning boilers within the



Wright's Steel Freight Car Truck.

is well known to be an important factor, and its reduction, especially in the last cylinder of a series, is important for economy. It is receiving constant attention from careful designers, and its reduction is a constant source of gain.

The 13 lb. mark has also been reached by an increase in steam pressure with resulting increase in the number of expansions. In some cases a reduction in the size of the high-pressure cylinder has doubtless contributed toward economy, by means of which smaller surfaces are exposed to the boiler steam than would otherwise be the case. This carries with it a proportional reduction of initial condensation in the cylinder, which is most prolific in this cause of waste.

Still further, the 13-lb. mark has, in general, been attained by engines which have a low pressure cylinder larger for the work to be done than is commonly the case, so that the mean effective pressure referred to the low-pressure cylinder is in the vicinity of 21 lbs. There are occasional exceptions, as in the case of the Louisville engine, which worked with a mean effective pressure referred to the low-pressure cylinder of 25 lbs. Such cases are exceptional, and their economy can be attributed to great perfection of detail.

It will in general be observed, however, whatever may

period that we are considering? The horizontal return tubular boiler is still the standard of the country, and will probably so remain. It is cheap, and, if properly built, it is safe. As its tube-heating surface can be effectively blown with steam with the certainty that the jet will strike every part thereof, and as, furthermore, its tubes can be effectively scraped at any time without taking the boiler out of service, it must necessarily be more economical than any of the numerous water-tube boilers which are now being introduced. The fire surfaces of the latter can only be indifferently blown, and they cannot be scraped at all unless the boiler is cooled down, and in general it cannot then be done with anything approaching thoroughness.

There is scarcely any improvement to be noted in the horizontal return tubular boiler during the last 27 years as far as economy is concerned, but grates have been improved to a measurable extent, resulting in an economy of perhaps 2 per cent.

My own experience teaches me that the internally fired boiler, either of the locomotive or vertical type, will save under equal conditions some seven per cent. of coal compared with the horizontal return tubular boiler, besides causing an important economy in doing away with brickwork. Mr. Bryan Donkin, in a recent

*Extracts from a paper presented at the New York meeting of the American Society of Mechanical Engineers, Nov. 29, 1897.

Tender brakeshoe.....	Brooks
Driver brakeshoe.....	Ross-Meban
Air pump.....	Westinghouse, 9 1/4 in.
Air pump governor.....	Westinghouse
Water brake.....	Le Chatelier by Brooks
Steam gages.....	Crosby Steam Gage & Valve Co.
Engine truck springs.....	Chas. Scott Spring Co.
Driving springs.....	" " "
Tender springs.....	" " "
Other specialties.....	Whistle—"Barnes"
Staybolt and piston rod iron.....	Taylor Iron & Steel Co.

Street Railroads and Municipal Corporations.

In our last three issues we have given brief reports of the work of the committee appointed to investigate the question of the proper relation of street railroads to the municipalities in which they operate. The hearing was continued on Friday last, at which time Mr. E. W. Burdett, representing the Massachusetts Street Railway Association, submitted some interesting testimony.

In the first place, he stated that it was not the desire of the Association which he represented that the committee should enter upon a general or sweeping revision of the existing laws relating to street railroads, as this would tend only to confusion. He traced the history of the progress of street railroads from 1866, when the total mileage in Massachusetts was only about one-third of the present mileage of the West End road, to Sept. 30, 1896, when the total mileage was about 1,300, of which the West End constituted less than 25 per cent. He pointed out that the street railroad subserves the original and principal purpose of highways, in that they do not exclude other use of public thoroughfares, and consequently should not be subject to taxation. This point he further emphasized by stating that the Supreme Court had expressly decided that neither horse nor electric railroads constitute a new use of the highways.

The next point considered was in regard to the increased cost of maintenance and repairs of streets due to electric railroads, and he maintained that while they had increased the cost of road maintenance, they had at the same time given ample returns to the municipalities in several ways:

First, in the form of direct taxation, and second, in the form of additional paving, road widening, bridge building, removing of snow, ice, etc.

Regarding the question of taxation, he said that whatever might be the theoretical demands of the case, as a matter of fact the companies could not afford to pay any more than they were now paying. The average rate of dividends for the last 10 years has scarcely increased at all, while the percentage of surplus to capital stock has steadily fallen from 15.01 per cent. in 1886 to 1.66 per cent. in 1896, and this decline has been most rapid since the introduction of electric traction.

Regarding the absence of surplus accounts or sinking funds and of proper charges for depreciation, the matter was summed up in the language of a report of the Railroad Commissioners in 1896, where they say: "If it were not for the increase in the volume of traffic and the reduction in the ratio of operating expenses, it is quite certain that the career of the electric railway would be a brief one."

By assuming, said Mr. Burdett, for the sake of argument, that the companies can and should pay more, the question then arises: In what form should it be paid? Four methods have been suggested: (1) a reduction in fares, (2) a tax on or division of net receipts, (3) a tax on gross receipts, and (4) a combination of the second and third.

In the first place, the American method of one fare for an indeterminate ride is decidedly in the interest of the general public. Those who can afford to, may pay five cents for a short ride, but those who desire to go the greatest distance, do so at a minimum charge. This has the effect of building up suburbs and the working people can live under better conditions than exist abroad.

The question of sharing net receipts brought out the fact that the application of the idea of partnership should logically involve participation in losses as well as profits, but this latter is not suggested. If, however, public sentiment requires that there should be a readjustment of the burdens which the companies now carry and of the payments which they now make to the towns and cities, this might be done by a combination of the method of profit-sharing and taxes on gross receipts as well as in any other way. But so far as the companies are concerned, this must be understood to be purely a readjustment of and not an addition to the existing burdens.

Under the question of a tax on gross receipts, Mr. Burdett stated that out of 77 active companies, no less than 62 of them had gross earnings of less than \$100,000 yearly, and that of the balance, 12, had gross earnings of between \$100,000 and \$500,000.

Regarding recent legislation, Mr. Burdett believed that the bill submitted to the Legislature of 1897 by the Associated Board of Trade seems to form the best basis for an attempt to formulate further legislation on the question of taxation of street railroads. This bill provides for a uniform tax of three per cent. upon the gross earnings of the companies and an additional payment of a sum equal to the amount paid in dividends over five per cent., but with the proviso that no company shall be compelled to pay the tax whose earnings in any given year have not, as found by the Railroad Commissioners, been sufficient to pay all necessary and proper charges, exclusive of the tax, to properly maintain its track and other property, and to pay five per cent. on its capital stock; and any such corporation shall be compelled to pay only so much of said three per cent. as it shall earn in

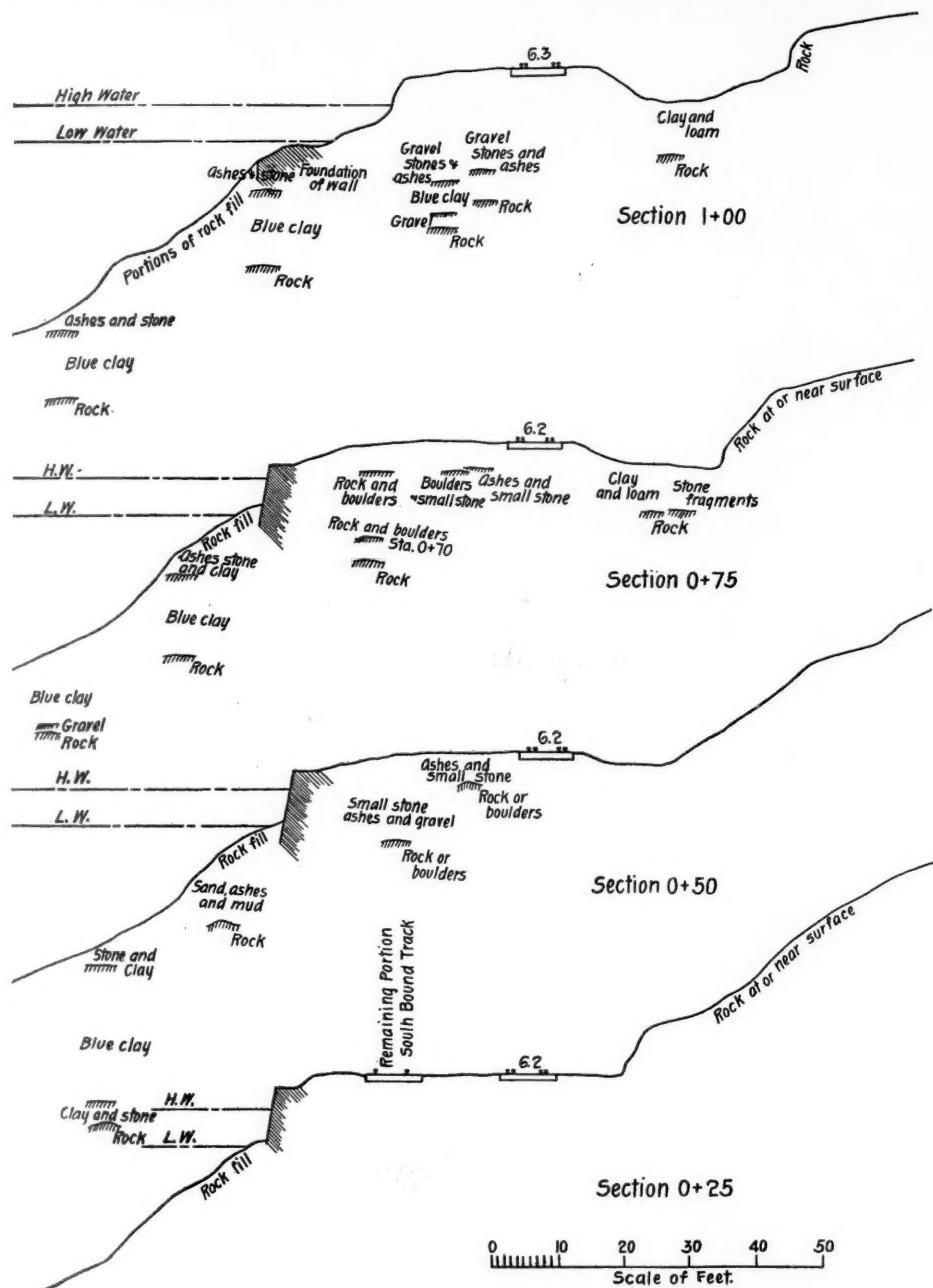
excess of five per cent. on the capital stock as thus determined.

He then discussed the various bills which had been referred to different committees, and also to the question of municipal ownership, to which he was strongly opposed.

In closing, Mr. Burdett discussed the undesirability of term franchises in Massachusetts, that is, the grant of rights in public streets for a given length of time. In this connection he showed how much better the present indeterminate, or unlimited system, in different parts of Massachusetts had operated as compared to different methods in other states and countries, both in the matters of fares and accommodations and in the growth and capitalization of the companies. Indeterminate franchises are given in all New England states, except Rhode Island. The capitalization of street railroads in that state is \$119,103 per mile, as against \$52,311 in Massachusetts. The average in all the New England states (except Vermont) is \$54,777 per mile, in New York it is

tire of the front right wheel of the truck of the locomotive and pointed out a small indentation or cut in it, which could have been made by some sharp edge like the end of a rail.

The session began Monday with the testimony of Prof. William H. Burr, who was employed with Mr. John Bogart by the railroad company to make an expert examination. Professor Burr testified that the total length of the disturbance of the track was about 200 ft. and the width 25 ft. The vertical face of the break was about 15 ft. The wall at the toe of the slope was destroyed by an abrupt break. The broken face of the embankment showed the different materials of which the roadbed was made. These were all good and borings showed the character of ground; and careful surveys were made. The borings through the roadbed and 40 or 50 ft. out into the river showed the different materials used and the gravel and clay formation over bedrock. There was no evidence of any disturbance of the roadbed by water



Cross Sections of Embankment at Garrisons, N. Y.

\$182,756, and in Pennsylvania \$139,456. The average capitalization per mile of street railroads in the entire United States is \$95,000 per mile; in Great Britain, \$53,000, and in Canada, \$50,200 per mile. From these figures it is seen that the capital per mile in Massachusetts is less than in any other of the places named, with the exception of Canada.

The Garrison Accident.

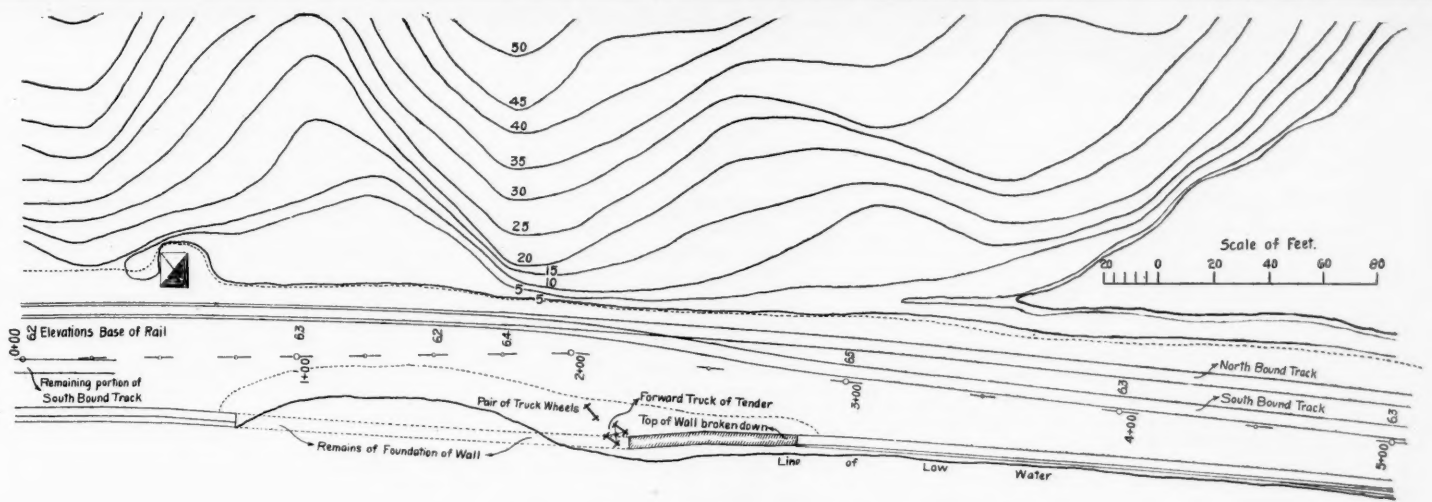
The inquiry into the wreck on the Hudson River division of the New York Central, near Garrisons, Oct. 23, when a derailed train went into the river, has been the subject of an investigation by the State Railroad Commissioners. A hearing (the last, we believe) was held at Albany last Monday. Among those who testified were Mr. Bogart and Professor Burr, who have made a careful survey of the ground, and we reproduce a part of the plan and sections presented by them. The following is from the report made by the Albany Argus:

Mr. Toucey and other railroad officers appear to be satisfied that the rails were tampered with and that the break in the embankment was caused by the train after it left the tracks. As evidence of this they produced the

which flowed from the hill on the east and settled in a pool on the east side of the embankment. There were no evidences of any softening of the roadbed. Some doubt existed in his mind whether the river had washed or affected the toe of the slope. No evidence of inferior construction was observed.

Questioned about a spot of clay which Colonel Cole had observed at low tide, he said if there was any considerable area under the wall subject to unbalanced pressure it would be prejudicial to the stability of the wall. The wall, however, was never intended to hold the embankment, but merely to protect the toe of slope from the wash of the river. If there had been no water the wall would not have been needed. There was space enough between the wall and the tracks to give the embankment a natural slope if the wall was considered a part of the embankment.

As to the cause of the giving away of the embankment he said his investigations left him much in doubt. He was unable to come to any positive conclusion. A derailed train may have been the aggravating cause. A softening of the toe of the slope, gradual and going on unnoticed for years, or a combination of both, might be cited as reasons. He could reach no definite conclusion.



Plan of the Scene of the Wreck at Garrisons, N. Y., Oct. 24, 1897.

The roadbed had stood for years, which was an evidence of stability. There was no evidence of a movement of the blue clay stratum.

Mr. Bogart testified to the details of the examination which he and Professor Burr had made. He had studied the character of the roadbed and the material it rested on to ascertain if there had been a movement of the gravel and clay bed upon the bedrock. No evidence of such a movement could be found. The disturbance was of the artificial filling. The protection wall was a sub-

stantially built dry wall, constructed to protect the slope of the embankment from the wash of the water, and particularly from ice. The filling between the wall and the tracks he hardly thought could bring any thrust upon the wall by reason of the loads borne by track and roadbed. He observed no deterioration of wall or roadbed attributable to the action of water from river or gully. The vertical face of the break stood firmly with the water lapping its base. The northbound track stands without surface depression

There was no drainage of water from pool through the roadbed.

As to what caused the bank to give way, he said: "I am unable to say what the cause of the catastrophe was. The derailment of the train might have caused all, or substantially all, of the conditions I found existing there after the accident. Whether that derailment was caused by one or another reason, I have not concluded. I do not see any positive conditions before the accident that would lead to apprehension of the accident. I have no theory as to the cause, which I feel is absolutely certain, except that I think the derailment of the train from some unknown cause would have created the conditions I found."

Mr. W. L. Derr, Division Superintendent of the Erie, stated he had twice viewed the place and believed that the train was derailed from some cause other than the failure of the embankment, which had given way because of the derailment.

Superintendent of Motive Power William Buchanan testified to service on the Central since 1847. He described the damage to the locomotive and dwelt particularly upon the indentation in the tire of the front wheel of the forward truck which ran on the western rail nearest the river. The tire was exhibited and a plaster cast of the indentation. He pointed out how he considered this evidence that the rails had been tampered with in such a way as to derail the train.

Pieces of rail from the east side of the southbound track were shown, and Mr. Toucey, with Mr. Buchanan and other experts, pointed out where there were marks which seemed to show that a wedge of some kind had been forced in at a joint and the plates pried off. It appeared to be their theory that rails had been pried up at a joint, and the locomotive wheels, by striking it, had been thrown off the track.

Mr. P. H. Dudley gave expert testimony relative to the strength of rails and the force of impact of a train, and his testimony corroborated in a measure the theory of the railroad officers that something had displaced the rails and indented the wheel before the train left the tracks.

Assistant State Engineer Lentz, who was sent by the Commission to examine the break, testified that the pool on the east of the roadbed was fed from the springs in the marshy ground on the hill east of the tracks. He found that 180 gals. of water flowed down the gully in an hour. He made a horizontal boring into the face of the vertical break above high tide and found the gravel strata of the roadbed damp. It was impossible, he said, for Section Master Claire to have seen the tide rise and fall in the pool, as stated. The break was very similar to one that occurred on the Champlain canal where a bank slipped over a saturated strata and went down into a meadow, leaving the towpath intact just as the track bed was left at the Garrisons accident. His conclusion was that the water flowing from the gully had a weakening effect on the roadbed. Could not say it was sufficient to have made it dangerous, but its tendency was dangerous. The material used in wall and roadbed he found of good quality.

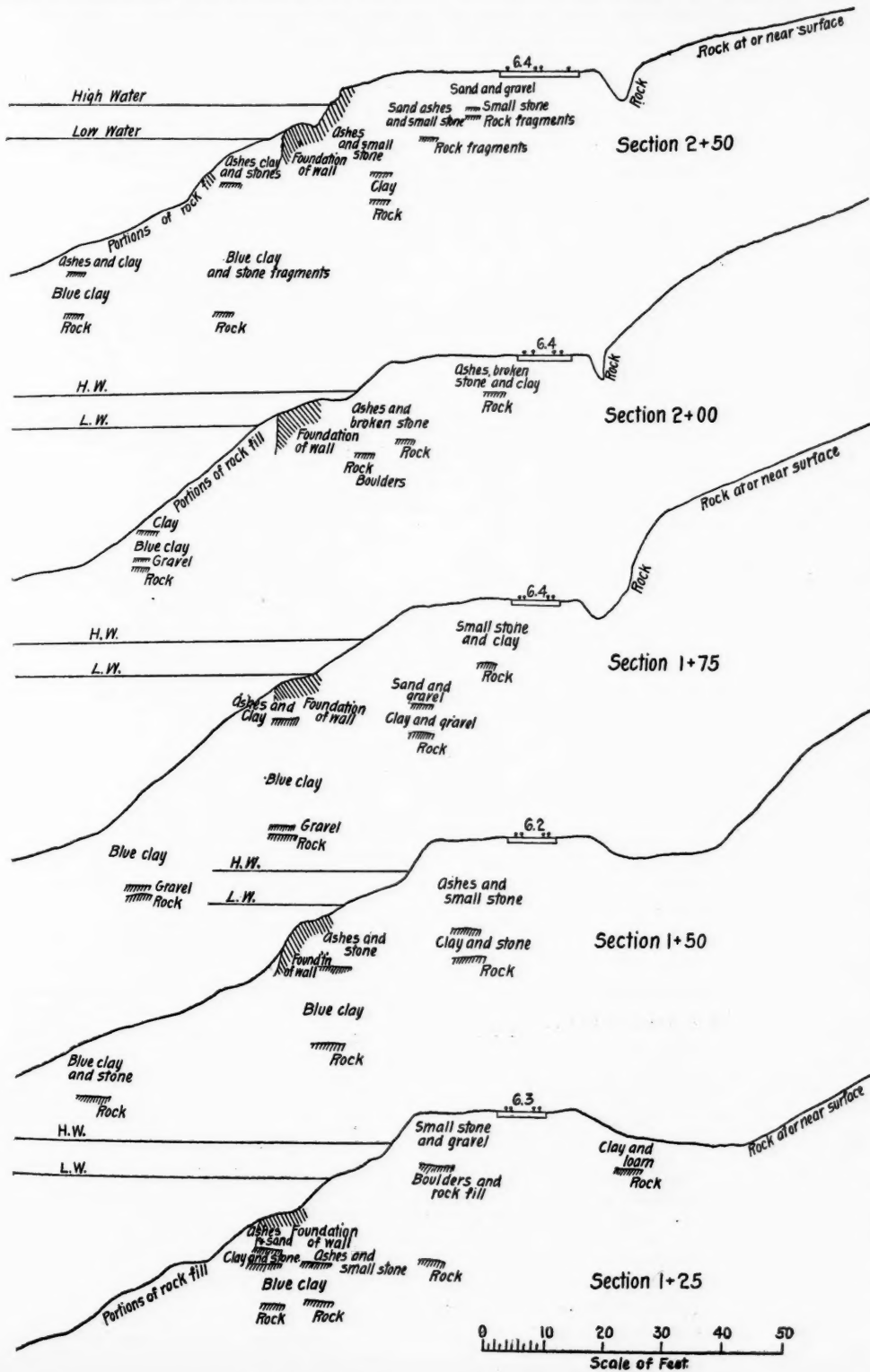
Track Elevation in Chicago.

At a special meeting of the Chicago City Council, Dec. 3, two ordinances were passed providing for the elevation of certain tracks of the Chicago & Northwestern, and the Chicago, Milwaukee & St. Paul railroads.

The Chicago & Northwestern ordinance covers that portion of the Milwaukee Division between West Chicago avenue and Diversey avenue, beyond which point the tracks are already elevated; also the tracks of the Wisconsin Division, between Clybourn place and Wood street, where a portion already elevated is reached.

The Chicago, Milwaukee & St. Paul ordinance provides for the elevation of the Milwaukee Division, between the Central Park Boulevard viaduct and a point just beyond Irving Park Boulevard; on the Council Bluffs Division the tracks are to be elevated between Lawndale avenue and West Fortieth avenue. The Mayfair cut-off will also be elevated.

The two ordinances cover about eight miles of track, and the work is to be completed within three years. The estimated cost, which is borne by the railroads, is \$3,000,000.



Cross Sections of Embankment at Garrisons, N. Y.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The Pittsburgh, Fort Wayne & Chicago has combined a local passenger train and a local freight in a manner slightly different from that usually adopted. A local passenger between Crestline, O., and Fort Wayne, Ind., did not earn expenses, and, according to the ideals of most superintendents, there was nothing to do but take it off. To change a passenger to a mixed train always lengthens the time so much that the people are about as dissatisfied as though there were no train at all. But in the present case, the train is retained in the shape of what might be called a limited mixed train. It is called a "package freight," and will take only a few freight cars. It is planned to have it stop not more than 15 minutes at any station, and to take no packages weighing over 250 lbs. each. Presumably, the regular local freight trains are sufficiently heavy already to make it desirable to relieve them in this manner. An experiment of this kind will be of interest to many superintendents. No one takes any pride in mixed trains, and the general tendency is to abolish them as fast as the growth of business will warrant, and perhaps a little faster; but unavoidable necessities, of economy on the one hand, and of accommodation to travelers on the other, compel their retention in a great many places, and undoubtedly would warrant their running on some roads where they have been abolished. The problem of making good speed and regular time with such a train is, however, always difficult. In this Fort Wayne experiment the weight limit is meant, evidently, to prevent excessive delays. But such a train, like the ordinary express car on passenger trains, must often find its greatest profit and usefulness in serving the people who want barrels of beer or pieces of machinery or other things which weigh more than 250 lbs. each. Presumably this limit is somewhat flexible.

The rule requiring locomotive firemen to look out for all fixed signals, and to always communicate with the engineer on approaching one, has been in force on some roads for many years, and we have never heard of its being given up by any Superintendent who tried it and carefully watched its working; but many still seem to care nothing for it, and some which have adopted it appear to have only a languid interest in getting it enforced. A correspondent on the Wabash road, commenting on the serious butting collision which was discussed in our editorial of October 29, calls attention to the obvious fact that if this rule had been in force there at that time the chances that the error would have been avoided would have been greatly increased, and quotes the rule of the Wabash on the subject. This rule, more thorough and detailed than most such rules, reads as follows:

Firemen must be in position to see the governing signal at each railroad crossing, interlocking plant, semaphore and telegraph signal, or at any dangerous point, and must call to the engineer the position as he (the fireman) sees the signal, viz.: "All clear" or "red." The engineer must in turn see the signal and repeat aloud after the fireman, "all clear"

or "red," and be governed accordingly. At railroad crossings not protected by signals, "all clear," must be called and repeated by engineers before going on the crossing. All freight train brakemen and rear brakemen on passenger trains must know positively the position of each telegraph signal, and will be held equally responsible [with the engineer] for passing the same when red is displayed. Firemen on trains running under meet or time order must call aloud the number of the engine met or passed on order, and the engineer must repeat it aloud after him.

In addition to this the Wabash requires the flagmen on passenger trains to ride on the rear end, and when passing a telegraph station to fill out a blank, showing the name of the station and the exact time; whether or not the telegraph block signals were thrown to danger after the train passed, and at night the number of main line switch lights that are not burning brightly. This report is turned into the train dispatcher's office at the end of each trip, and the dispatcher checks the passing time with the train sheet and calls for an explanation from operators who are negligent in handling the block signal.

This utilization of the brakeman as a signal inspector seems in every way commendable. We have before now recommended a similar rule on roads where automatic block signals are used. To be consistent with other signals, automatic block signals ought to go to the danger position immediately after the engine passes them (instead of just before, as is the case on many roads), and if they are thus worked, the engineer cannot personally know whether or not each signal is in working order; but the brakeman can see them; and systematic care in this matter, by one man on every train, would be a material safeguard. On some roads where automatic signals go to danger behind the engine, there is a rule, more or less thoroughly enforced, that all trainmen must watch signals; but such a rule is too vague, and it is difficult to enforce. Responsibility is so much diffused that practically there isn't any to speak of. But with one man to deal with, and with the understanding that watching the signals shall be his chief duty when the train is in motion, the matter is reasonably simplified. Passenger brakemen now have little or nothing to do, and if something is not done to engage their activities they will become so mentally indolent as to be unfit for promotion to the higher places where their experience is wanted. There is a possibility that a man on the rear of a train cannot always see the face of a signal, for it may be hidden by smoke; and where disk or enclosed signals are used this may prevent his seeing the signal at all; but this difficulty should not condemn the rule, for, with a record to keep, like that on the Wabash, the brakeman may be held to the duty of definitely knowing whether, in the case of any particular signal, he did or did not see it, and that is the main point. The duty of the rear brakeman is to protect his train from rear collisions, and if, in case of an unexpected stop, he knows that he did not see the last preceding signal, he can go back with his flag. If he knows that he did see the fixed signal and that it went to the danger position he can depend upon that for protection. We are not unmindful that the rules forbid him to depend upon the fixed signal; but, as was to be expected, American brakemen, like their English cousins, do depend upon the block system in spite of the rules. Our own observation on this point is confirmed by the testimony of the General Manager of a large road which has now maintained space intervals several years. But whatever may be the practice of brakemen in the matter of flagging, it is much more satisfactory to know that an automatic signal has gone to danger behind a train than to simply know that the signal is well designed and well cared for and has never been known to fail. And if a superintendent directs all his brakemen to regularly get this knowledge he can, with proper discipline, have the next best thing himself—confidence.

Rapid Transit in New York.

It is quite possible that by the time this impression of the *Railroad Gazette* is in the reader's hands the fate of the plan of the New York Rapid Transit Commissioners will be known. It has been expected that the decision of the Court would be given to-day, and speculative opinion has lately been pretty well agreed that the decision would be adverse. We shall not guess about this, but it is interesting to conjecture as to the effect of an adverse decision.

We judge that it would be a misfortune to the city. This is not to say that the Court could, or ought to, decide favorably, or that, in the actual state of the city's finances, a favorable decision would be right. That is a question of law and fact, and the Court must decide according to these. We

mean that it would probably be a misfortune for the city if the law and the facts are such that the project cannot be carried out as planned.

In saying this we take back nothing of what we have so often said in the past—that the quickest, cheapest and best way of getting rapid transit in the city would be by improvement and development of the lines and methods of the Manhattan Company; but the failure of the plans of the Commissioners would probably be the end also of any chance of adequate improvement and development of the elevated system for several years.

The course of events, in case the court decides against the Commission, will probably be the resignation of all the Commissioners but the three *ex-officio* members, viz., the Mayor, Comptroller and President of the Produce Exchange; filling up the board with Tammany men; a dicker with the Manhattan, which will cover electrical equipment, some additional third track and perhaps some enlargement of the terminal facilities. Beyond this the Manhattan is not likely to go willingly and with the underground enterprise killed it cannot be scared or coerced into any reasonable and proper plan of extending its tracks into streets and districts not now occupied, or into running such additional car mileage as electric motive power, more third track, longer platforms and improved terminals would make possible.

The obvious policy of the company has long been to do nothing that would add to fixed charges, or to working expenses, even to increase or to hold business. Meantime it has played a waiting game, temporizing and trusting to time and circumstances to kill a possible dangerous rival in the underground.

There are some powerful reasons for this. Such improvements as would increase fixed charges and operating expenses would, it is true, increase gross earnings, but probably not in proportion to the increase in charges. Thus the net over all charges would be diminished. This is probably true of such changes as would add to the mileage of track to work and maintain, and to the car mileage. Furthermore, the magnificent development of surface roads now going on so fast is sure to take off more and more of the short-trip business and the long-distance business is probably not profitable. So the owners of the property may well hesitate to put any more money into it.

Whether or not this is a just view of the policy which has controlled in the board of the Manhattan, at any rate it is backed by the fact that the company has never made a proposition to the Rapid Transit Commissioners which that body could accept, and has not made one recent improvement which it was not forced to make. For example, the story of the introduction of gas lighting on the cars is one of haggling, of deceit, and of dull and obstinate delay. One would suppose that an enlightened management would anticipate public wants and foresee the course of events—and so it would.

If the settled policy of the Manhattan Company is to keep things just as they are and avoid any increased fixed charges or working expenses, even at the risk of losing traffic to the surface lines; if the reorganized Commission will be overwhelmingly a Tammany body and amenable to the logic which is most powerful with Tammany bodies; if the fear of a rival rapid transit system is laid, why may we expect even the improvements suggested above, viz., electric motive power, more third track and larger terminals? This is an obvious question. We have some reason to believe that the element which understands the changes in contemporary conditions, which looks ahead a few years, and which knows something of the value of a friendly public opinion, is gaining influence in the Manhattan board. There is considerable reason to think that the obstructive (and destructive) policy is weakening. On the whole, then, the situation may not be entirely bad, even if the Court does decide that the constitutional limit of the debt of the city would be exceeded by the building of the underground system; and if the Commission ends its life with such an arrangement as we have suggested, it will still have been worth to the city more than it has cost.

The Legalization of Pooling.

Congress is now in session, and discussion of the various propositions to amend the Interstate Commerce law is becoming more active and general. Mr. Milton H. Smith, President of the Louisville & Nashville, has come out with an interview filled with vehement protests against the legalizing of pooling, if, to get the right to pool, the railroads must submit to a law empowering the Interstate Commerce Commission to prescribe transportation rates. He shows,

with great force, that the railroad business of the country involves problems of such intricacy and magnitude that no commission could ever deal with them. We have difficulties under the present laws, which empower each railroad to make rates for itself, but we should have still worse troubles if one central governmental authority attempted to do the work. Only an ideal body of experts could even touch the subject, and no such ideal body is possible. On the other hand, says Mr. Smith, the pooling privilege may easily cost more than it is worth, if it is hampered by conditions—even less onerous conditions than that mentioned—for it would not by any means prove a cure-all. Pools do not kill out the spirit of rivalry between railroads; they only regulate its exercise.

The New York *Journal of Commerce*, interviewing merchants on Mr. Smith's propositions, says that the merchants, those of them who believe a pooling law would be beneficial to general mercantile interests, are unable to understand why he is so quick to throw aside all hope of getting a law; but the explanation is not hard to find. In the first place Mr. Smith does not object to pooling in itself; only to the doubtful if not dangerous conditions which the politicians threaten to attach to the law. In the second place Mr. Smith's road is the oldest and strongest in its territory, and between important points probably the shortest; with these advantages he can endure the present unhealthy conditions longer than his competitors, and therefore has less to fear than they. It is a perfectly rational position for him to take, that a pooling law is desirable, but not an absolute necessity. The Pennsylvania, another strong company with lines more direct than those of its competitors, was credited last winter with holding similar views.

On the other hand conditions may be very much worse in one region than in another. Mr. Depew, President of the New York Central, represents one of the two strongest lines from Chicago to New York, but he tells the reporters, in effect, that the dressed beef trust and other shippers who own freight cars have become so powerful that even strong roads need the help of other roads in fighting them. Mr. Depew did not say so, but we have it from other sources, that owners of refrigerator cars will send such cars half loaded when business is slack, thus getting their fat mileage rebate twice as often as there is any legitimate reason for it. And Mr. Depew sees clearly the depressing effect on general business of the starvation rates and incomes of the railroads under present conditions and, therefore, argues stoutly for the legalization of pooling.

The managers of the St. Louis Traffic Bureau have formally instructed their Commissioner, Mr. Vanlandingham, to attend the Washington meeting of the National Association of Freight Commissioners next week and "oppose the recommendation of any amendment to section 5, or anti-pooling section, which would specifically legalize the pooling of freights or earnings of railroads." Mr. Vanlandingham tells a *Republic* reporter that—

"Shippers who favor legalizing pools are influenced by arguments of their railroad friends and have not studied the other side of the question. No railroad pool has so far existed in this country which did not in some manner unjustly discriminate against persons or communities. Discriminations injurious to communities and cities are not always in rates, are no: always susceptible of legal proof before a commission or a court, but are none the less hurtful. Unjust discriminations are as likely to be in train service as in rates. Without competition, or with the knowledge that the earnings would be divided on some agreed basis, the incentive to furnish better facilities and better service would be reduced to a minimum, would be a discrimination which might divert large volumes of business to other cities, and yet be legally impossible to be proved as caused by the existence of a pool between railroads centering at the city injured."

As Mr. Vanlandingham is an ex-railroad officer, his utterances will probably have great weight with shippers when his views on traffic questions agree with their own hazy notions on the subject. And we have no doubt of his sincerity, but we suspect that the terror of the St. Louis merchants, over the possibility that their fast-train fare to New York will be made higher than that from Chicago, has colored his views, for he must know that as regards the great bulk of the interests that would be affected by the establishment of pools—the grain and provision shipping interests—the proposed law would favor the majority of his constituents and harm only the few large concerns which, under present conditions, are large enough and strong enough to secure secret reductions from regular rates.

The first sentence of the interview quoted is, unfortunately, only too true. Merchants are induced to favor the repeal of the present law; but the reasons for desiring a change are so hard to make clear to the non-railroad understanding that the railroader who makes such converts is liable at any moment to find that they are utterly unable to give a reason for

the faith that is in them. Such being the case, the only thing to do is to continue the campaign of education, with tenfold additional power.

Merchants' and Buyers' Excursions.

The retail merchants of Boston have been enjoying a "gala week," as the wholesalers of New York did a few weeks ago, by reason of the presence of a considerable extra number of out-of-town buyers whom the railroads brought in at reduced rates. What the extra trade really amounted to is hard to get at, as was the case in New York, because the accounts published by the local newspapers are composed so exclusively of glittering generalities; but whether much or little, the skill of the Boston reporters in gilding a few very commonplace facts has had its effect, and the smaller cities are as mad as March hares, if we may judge by their newspapers. Their anger seems to be much more peevish than any that was shown toward New York.

The merchants of Portsmouth, N. H., threaten to buy their goods in New York hereafter, and to establish steamboat lines to take business away from the offending railroads. In Springfield, if the academic utterances of the *Republican* may be trusted, the merchants are so incensed that, notwithstanding their conservatism and their personal interest in the shares of the Boston & Albany (on which they and their sisters take a free ride to Boston every year), they are inclined to have the state buy up the railroads and abolish discrimination. Says the *Republican*:

"Those having charge of the merchants' 'gala week' at Boston regard the affair as so successful that they talk now of making it an annual affair. Why not make every week of the year a 'gala week'? Why not, in a word, compel the railroads to give the Boston merchants a special reduced rate all the year round? Why not have the roads establish a passenger rate of one cent a mile to Boston from all points in New England, while for all other places the present rate of from 2 to 2½ cents a mile is maintained? The roads have no business under the law or the theory of their establishment to make a special rate for one week or one day in behalf of the trade of any place; and in doing so in the present case they are proceeding lawlessly, and the man who solicits an unjust discrimination from a common carrier is guilty of a crime along with the carrier. They are all acting in contravention of law and equity, as were the trunk line roads and the New York merchants in the recent 'trade excursions'; and the only defense offered in the Boston, as in the other case, is a contemptuous silence on the part of all concerned. But that is the only defense which can be offered. These lawless discriminations in favor of persons and places have been making votes by the thousand among the masses of the people in favor of government ownership of the roads as the only remedy for these evils of private control. The railroads are now slapping in the face every retail merchant in all the New England territory affected by the special rates conceded to the Boston retail trade."

On theory there is much justification for the strictures here made; but when we come to the actual facts the confusion of interests is so puzzling that what to do is hard to decide. The railroads have been carrying people from Springfield to Boston on excursions every summer for a dozen years at half a cent a mile, but we do not recollect that the merchants or the newspapers have objected. Likewise at New York, Western merchants came on G. A. R. or Christian Endeavor excursions, and nothing was said; but a "Merchants' Excursion" at once made trouble. Does the season of the year make all this difference? Again, the big "department stores" seem destined to gradually kill off the small dealers whether the railroads help or hinder; which course will please the largest number?

We have no desire to irritate our New England friends by unseemly levity, but we cannot help wishing that they had the comforting resource that has recently been availed of by the merchants of Elberton, Ga. At Elberton, according to an Atlanta paper:

"A quarantine has been laid against Atlanta on account of smallpox. The smaller towns are quarantining against other smaller towns. Elberton, for instance, has quarantined against Conyers and Griffin. Two or three towns have quarantined against Jonesboro. A citizen of one of the towns [answering the claim that the quarantine was unnecessary] said yesterday: 'You see the farmers are still taking cotton to sell and our merchants do not want them to visit Atlanta and spend their money. We want to keep it at home. The holidays are coming and our farmers would run over to Atlanta to do their Christmas buying if there were no restrictions. We just thought it would be a good idea to slap on a quarantine and keep the farmers and their money at home.'"

Practically every bond on the New York Stock Exchange list advanced during the week and some of the appreciations were comparatively heavy. The investment character of the buying has grown more distinct in the last 10 days. The steady flow of funds from the interior, the accumulations in banks and the inability of holders to realize fair interest in the loan market, have driven capital in large sums into the bond market. Among the buyers the savings banks were prominent. The success of the Rock Island refunding plan has helped along the buying, as it has contributed to confidence in the general situation. The President's message was also an influence in the same direction. Some idea of the importance which this buying movement has reached is obtained from the daily record of transactions. On Monday 124 issues, or within four of the record of last summer, were traded in, the amount, par value, involved being \$3,800,000, or about \$1,500,000 above the normal. Among the features on Monday was an advance in the new United States 4's of 1925 to 128½, which was the highest record up to that date. Centers of activity during the week were Atchison 4's, Chesapeake & Ohio 4½'s, Erie prior liens, Northern Pacific 3's and 4's, Texas Pacific 1st and 2ds, Kansas & Texas issues, other Southwestern bonds, Metropolitan Street Railway 5's and the Granger issues. Practically every good bond enjoyed a demand of importance. The bond developments of the week outside of the market were the offers of \$5,243,070 of 3½ per cent. bonds and stock of the city of New York to

public subscription, and the sale to Kuhn, Loeb & Co. of \$20,000,000 of the Chicago & Northwestern 3½ per cent. 90-year general mortgage gold bonds. These bonds are a part of the issue of \$165,000,000 recently authorized, of which \$131,640,000 is to be used in retiring outstanding bonds that are now near maturity, and the balance for improvements on the property. The lot was offered at 101 with accrued interest. The cash subscriptions were limited to \$2,000,000 and the balance reserved for refunding certain of the short term issues of the company. On the day following the announcement cash subscriptions were closed.

On the Canadian Pacific Railway brass baggage checks have now been entirely abandoned, or rather cardboard checks have been universally adopted; a brass plate with turned over edges is used on the strap to hold and protect the cardboard check, but it has no number, and from a clerical point of view the check is only a piece of cardboard. Each check is, of course, used only once, and whenever a shortage is reported the number reveals at once the date and the place where the baggage was checked. Mr. MacTier, the General Baggage Agent, informs us that after several months' experience mismatches are practically unknown. For all stations to which much baggage is sent, each station baggage-man has rubber stamps with which to stamp the destination. For the smaller stations the destination is written. All checks being used in consecutive order, some little time is saved in booking, as, for numbers with more than one figure, the entries may be grouped as in writing. Thus 74621 and the five following numbers would be written 74621-2-3-4-5-6. The principal benefits of the change from the old plan are the absence of mismatches and the much greater facility in tracing for lost pieces. There is, of course, an advantage in having no old, rusty out-of-date checks lying around and cumbering baggage-rooms, and the cost of new brass checks for every new destination or route, or change in names, is avoided; but the money saving is more or less neutralized by the constant expense for new card checks. The size of the cash balance for or against the new plan is a point on which we have no information.

The *Journal des Transports* gives the following as the average receipts and shipments per measured ton of vessels arriving and departing at various European ports, adding that a measured ton on the average is capable of containing 3,300 lbs. of freight. The figures are for pounds:

	Import.	Export.		Import.	Export.
Marseilles.....	1,795	895	Havre.....	1,863	719
Dunkirk.....	2,759	761	Genoa.....	2,290	232
Antwerp.....	1,710	803	Hamburg.....	2,407	1,514
Liverpool.....	2,055	1,476	London.....	1,984	746

Everywhere in Europe, therefore, imports exceed exports in weight, which is natural, since Europe consumes substantially all the productions of its soil, and to give sustenance and employment to its people imports vast quantities of raw materials from other parts of the world where the population is less in proportion to area and industries are less developed. All our ports would show much greater exports than imports, and at some, as at most Southern ports, the imports are insignificant. The favorable position of Hamburg is due to the export bounty on German sugar, of which more than a million tons have been exported in one year. Doubtless some English coal-shipping ports export almost exclusively.

The Austrian Minister of Finance proposes a tax on transportation, confined chiefly to railroad transportation, at the rate of 12 per cent. on passenger charges and 5 per cent. on freight charges. On the traffic of 1896 this tax would have produced about \$8,500,000. There has been a tax on transportation in Hungary for more than 20 years, and the French tax on passenger fares is well known. Coming after reductions in rates, which had been long urged, this seems like a re-establishment of higher rates under another name. The tax on freight rates is likely to be a serious matter in some industries where the materials are carried several times before the finished product reaches the consumer, and will weigh hard on some coarse articles, like pig iron and everything made from it, the industries producing which, frequently under existing circumstances barely succeed in existing.

NEW PUBLICATIONS.

Corporation Finance. By Thomas L. Greene. New York: G. P. Putnam's Sons. 1897.

This is a book of 175 pages setting forth the principles followed and methods employed in the financial management of railroads and other large corporations. Mr. Greene is already well known to readers of the *Railroad Gazette*, and by his writings in magazines on railroad matters. He is a careful writer and has packed his pages full of solid matter. He describes all kinds of railroad stocks and bonds and shows how to analyze an annual report, whether of a railroad or of a factory or a grocery company, so as to learn what there is in it.

A corporation is an impersonal thing, knowing no right or wrong, except such as may be required by its charter and the laws of the state; and yet corporations are managed by men of like motives with those who run country stores or go to the legislature, and the acts of corporations constitute, therefore, one of the commonest topics of public criticism. Mr. Greene discusses this aspect of his subject with eminent fairness and

lucidity, and a candid reading of this part of the work would be of considerable use to those editors and legislators who aspire to deal intelligently and justly with the intricate and serious economic questions which are pressed upon public attention by the rapid changes constantly taking place in modern business methods.

In his severe impartiality and his determination to treat his subject from a strictly scientific standpoint Mr. Greene leaves the reader, in most cases, to his own resources for practical illustrations from real life of the theories presented; though he introduces brief references to many well-known concrete examples of financing which will afford illustrations for readers of experience in the financial world, and will serve as hints for the inexperienced.

The chapter titles, indicating the scope of the work, are: 1, Bonds and Stocks; 2, Forms of Corporate Enterprise; 3, Railway Bonds; 4, Subsidiary Companies and their Securities; 5, Corporate Accounting; 6, The Examination of Railway Reports; 7, Public Policy toward Corporation Profits; 8, Corporation Reorganizations and Receiverships. The book is well worth having, to anyone interested in railroad properties, for the sixth chapter alone. Even those who already have considerable appreciation of the nature of railroad reports are likely to find this chapter useful for reference, for it sets forth in accessible shape many little points which are liable to be overlooked by reason of their multiplicity and of the obscure character of the information which often has to be dealt with in trying to study an annual report.

Transactions of the American Society of Mechanical Engineers. Vol. XVII., being the Thirty-fourth meeting, New York, 1896, and the Thirty-fifth meeting, Hartford, 1897. New York: Published by the Society, 12 West Thirty-first street.

This volume of the Transactions has 1119+XXIV. pages, and contains the papers and discussions of the meetings indicated in the title. It has a good table of contents and pretty full alphabetical index, and thus the great amount of valuable information contained in it becomes available to the student. The papers, including committee reports, listed in the table of contents, are 48 in number.

TRADE CATALOGUES.

Steam Boilers. Illustrated catalogue. By William H. Fowler, Assoc. M. Inst. C. E., etc. etc. Yates & Thom Canal Foundry, Blackburn, England. Price, five shillings.

Messrs. Yates & Thom are boiler makers, iron founders, millwrights and engineers (established in 1826) of repute and standing in their own country and abroad. This catalogue concerns only boilers and boiler fittings; an engineering catalogue is also published by the house. The boiler catalogue describes the Lancashire boiler proper and in various modified forms, as for example multitubular and water-pipe Lancashire boilers; Cornish boilers, the Fairbairn boiler and many different kinds of boilers, externally and internally fired. It describes also a considerable variety of fittings and gives certain useful tables of horse-powers of various boilers, properties of saturated steam, pressures in pounds and kilograms, and finally forms of estimates and specifications. The first 50 pages are given up to general discussion of many topics as, *e. g.*, efficiency, tests, combustion, power, etc. The numerous engravings are mostly from good line drawings and are actually illustrative, and the book is admirably printed and is made accessible by a copious index.

The Pearson Jack.—The Pearson Jack Co., 64 Federal street, Boston, Mass., sends a catalogue describing this device. As may be known, this jack consists of a right and left hand screw which runs in and out of two long nuts forming the barrel of the jack. The outward ends of these nuts are rounded, and these ends fit into corresponding sockets in the top and base plates, both of which are loosely attached to the ends of the jack. The older style of this jack was worked by a bar which entered holes in the square middle portion of the double ended screw. The latest jacks of this kind are provided with a spring ratchet to turn the screw. This is quicker than the bar and is more convenient. The Pearson jack will lift 14 in., and will swing a car 16 in. at one setting.

The pamphlet, which contains 16 pages, is illustrated with several pen-and-ink sketches and some half-tones. While we are not usually considered as art critics, and seldom have to pose as such, still we can hardly help observing how deplorably the draughtsman of some of the sketches must have neglected his early training in figure drawing.

American Society of Mechanical Engineers.

The attendance at the annual meeting of the American Society of Mechanical Engineers, held in New York last week, was the largest in the history of the Society. In our last issue we gave abstracts of nearly all the papers, and the remainder will be found in this issue, or next week. It would be impossible to give at this time an extended report of the discussions, but a few notes may prove of interest.

Mr. Gus C. Henning, a delegate to the International Congress on Testing Materials, held at Stockholm (reported in our last issue), gave an account of the proceedings of the conference, after which it was resolved that the Council appoint a committee to act jointly with a committee to be appointed by the Inter-

national Association for Testing Materials, the object being to establish standard specifications for the inspection of engineering materials.

The report of the boiler trial committee, of which Dr. Chas. E. Emery is Chairman, was read by Mr. Kent. The discussion, for the most part, took the form of suggestions to the committee, in order that they might present, as far as possible, a final report that would be the best for all concerned. Doctor Emery stated that careful thought for two years had been given to the subject, and that the report was virtually a compromise throughout. Mr. R. S. Hale believed that the report should contain a recommendation as to the thickness of the fire carried and the method of firing, and his objection to the form of the code which provides that the outside surface of tubes be taken as the measure of their heating surface resulted in an animated discussion. Mr. Dean argued that the simple fact of the practice of the navy to follow this rule was no reason why the Society should fall into what he regarded as a serious error.

A communication was then read in which it was pointed out that railroads are sometimes annoyed on account of different threads which are cut on the coupling unions. After discussion it was decided that the former committee on standard pipe threads should act jointly with the committee from the American Railway Master Mechanics' Association and the Master Car Builders' Association to devise some standard.

In the discussion following the presentation of Mr. Dean's paper on the Reduction in the Cost of Steam Power from 1870 to 1897, which is printed nearly in full in this issue, Mr. Sterling criticised Mr. Dean's position that return tubular boilers were still the standard. Mr. Kent questioned whether fire grates were any better now than they ever were, or that vertical engines had produced a saving over horizontal of seven per cent. The paper on Boiler Tests, Classification of Data and Plotted Results, pointed out that, according to the classified results, the vertical tube boilers gave the best results, which Mr. Kent believed due to the fact that the author had included some tests that were not in keeping with those of average practice.

On Wednesday evening a reception was held at Sherry's, President and Mrs. Warner and President-elect and Mrs. C. W. Hunt receiving the guests.

After the discussion following Mr. Stillman's paper on "A Water Purifying Plant," Thursday morning, Mr. S. M. Green described an electric purifier, which Mr. Kent pronounced a humbug. Professor Thurston stated that the U. S. Navy had used practically such an arrangement, inserting a zinc plate in the boilers of vessels, to produce an action similar to that of the voltaic cell, and others reported instances of the successful working of what is usually termed the electric purifier. Mr. Henning stated that it was well known that electric current in a boiler would prevent crystallization under certain conditions, the residue falling down in the shape of mud, which could be conveniently removed.

After luncheon at the close of the Thursday morning session, Mr. G. C. Henning showed a new method of reproducing colors in photography and exhibited some very excellent sample of work.

"An Accurate Cost Keeping System," by Mr. H. M. Norris, was read Friday morning, and brought out a somewhat interesting discussion. A few of the members believed that no accurate method applicable to the many varying conditions could be devised and that an attempt to follow out any scheme would not be advantageous in most cases. A few plans, however, were submitted as examples of those now practiced in different shops. Mr. C. W. Hunt urged the members to visit his shops in New York City, and examine the methods employed from beginning to end. Particular attention was called to the unaccountable items that figure up to a large amount by the end of the year, and reference was made to cases where superintendents or other officers had taken the time of the employees to do odd jobs for them and which in the aggregate amounted to quite a large percentage of the earnings. In such cases it was stated, not only the actual time of the men should be charged to such accounts, but also an additional amount equal to that in which the men would be able to earn for the company in that time, which is twice the amount that would be charged to an outsider.

Mr. Chas. T. Main's paper on "Valuation of Textile Manufacturing Property" called forth from Mr. Rockwood and others a discussion on the proper value that should be placed on machinery that had been used. Opinions differed as to whether an actual value could be placed on such machinery.

The subject of dustless buildings brought forth interesting discussions as to the composition of the dust that finds its way into the office buildings in the city, and as to the height the dust and insects reach in the lower part of New York. Regarding the latter point, Mr. Henning pointed out that in the St. Paul building no trouble was experienced with flies and insects above the seventh floor.

The paper on the Stevens' Valve Gear for marine engines was read by the Secretary, after which Mr. Andrew Fletcher, the author, gave a very entertaining account of the early work of Francis Stevens in making and introducing his valve gear. Mr. Fletcher's reminiscences were in fact a history of the conception and development of valve gears in this country, inasmuch as the early Stevens' type has been used ever since, either in its original or its modified form.

After the remainder of the paper had been presented, the meeting adjourned to convene at Niagara Falls in June next.

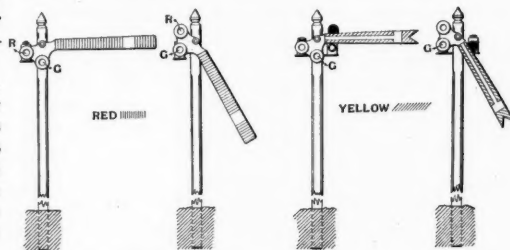
Distant Signal with Double White-Light Indication.

Mr. J. I. Vernon, Supervisor of Interlocking of the New York, New Haven & Hartford, at Mansfield, Mass., who has suggested the use of two white lights, placed in a horizontal line, for the night danger indication on distant signals, has sent us sketches, reproduced herewith, showing his proposed arrangement.

It will be seen that the plan requires no complication in standard materials, the same blade-casting being used for both the home and the distant signal. The extra lantern is of the same pattern as all other semaphore lamps. This, with the necessary bracket, and a sheet metal screen to attach to the upper side of the blade, will cost only about \$3.50 for each distant signal.

In the illustration the colors of the glasses, red and green, are indicated by the letters R and G. The spectacles unmarked have no glasses.

The adoption of two white lights as a caution signal would conform to the principle employed in the use of torpedo signals, where a signal consisting of two detonations requires the engineman to bring the speed of his train under control, while one detonation indicates stop. Where a green light is used to indicate all-clear,



Distant Signal with Two White Lights in a Horizontal Plane.

a single white light in a fixed signal indicates danger, so that it is consistent to have two white lights give the same indication as two torpedoes.

One objection to the use of a red and a green lamp side by side, for a distant signal, is that the red may be obscured by snow or smoke, while the green is still visible, thus wrongfully indicating all-clear. Again, the use of a special pattern of lantern requires special safeguards to prevent inexperienced lamp men from putting a lamp on the wrong post. If lamps are alike this error cannot be made.

Cleaning Passenger Cars.

In a discussion on the subject at the meeting of the St. Louis Railway Club, which was held Nov. 12, Mr. H. M. Smith, Master Mechanic of the Terminal Railroad Association, St. Louis, said:

"One of the most effective aids introduced in late years for the purpose of inside cleaning is the use of compressed air, which is used extensively and exclusively by the Terminal Company. In my opinion a car cannot be thoroughly cleaned without the use of compressed air.

"We use carbolic acid diluted with water for mopping all cars, and muriatic acid for cleaning urinal and hopper bowls. This is not only a good disinfectant, but removes all stains and discoloration.

"Since the opening of the new station we have cleaned 7,000 cars in one month. Up to the present time I have been unable to obtain any reliable information as to the cost per car from any company doing this class of work. At the annual meeting of the Master Painters' convention this year the subject of cleaning passenger cars at terminals was under discussion. Mr. Byrne, of the Chesapeake & Ohio, in answer to the question of cost, stated it cost them \$1.20 per car for labor only. He stated that his labor cost \$1 per day. At the October meeting of this Club Mr. Gohen stated that on one division of the Big Four the cost was about 25 cents per 100 miles run, but he would judge their average cleaning cost from 15 cents to 17 cents per 100 miles run.

"Under the system employed by the Terminal Company of St. Louis we are enabled to arrive at the cost of cleaning any of the cars of a passenger train generally to the fraction of a cent. In the month of May, 1897, the average cost per car was 48 cents. This was the lowest ever reached. For the month of October the average cost was 50.7 cents. The highest on any line was 66.3 cents; the lowest was 30 cents per car. This includes labor and material. There are 11 roads that have their cars cleaned by the Terminal Company. The price varies on each road and on no two roads is it alike. A train composed of plain day coaches is cleaned for a certain price—you add a chair car, the price is increased; you attach a parlor car, the price is again changed. A vestibule train, with brass-mounted railings on the platforms, increases the cost of cleaning.

"Some of the trains we clean run as far south as Galveston, Tex., a distance of 1,000 miles; others run as far east as Buffalo, N. Y., a distance of 732 miles. On the Eastern lines, particularly where there are several lines running in the same direction, competition is active, and nothing but equipment in first-class condition will meet the requirements of the management."

In continuing the discussion, Mr. J. A. Gohen, Master Painter of the Cleveland, Cincinnati, Chicago & St. Louis, promised to submit figures showing the cost of cleaning cars. His statement is as follows:

"To wipe outside of coach, sweep and dust inside, clean

windows and saloon, 42c.; additional for washing steam pipes, washstand, window sills and spraying with formaldehyde, 22c.; to scrub with Modoc outside coach, \$1.95; parlor or diner, \$2.10; baggage, \$1.60, and postal, \$1.68. To clean thoroughly with powdered soap inside, blow cushions and spray with formaldehyde, \$1.98; general cleaning of dining cars, \$2.07. Average cost cleaning coaches, 60c.; average cost cleaning combination, 40c."

A Big Hydraulic Riveter.

Messrs. R. D. Wood & Co., of Philadelphia, have recently built for the Schenectady Locomotive Works two 100-ton triple-power hydraulic riveters. One has 12-ft. gap and the other 17-ft. gap. The 17-ft. riveter is shown in the engraving. The 12-ft. machine is essentially the same, except the important difference that the frame is made in one piece, which is cheaper and which has no serious drawback with the present perfection of the art of making steel castings.

These machines are especially adapted to riveting up locomotive boilers. The cylinder overhangs the

almost instantaneous. The advantage of this construction is obvious; it avoids stretching the edges of light plates, which is always done when excessive power is put upon them. It also economizes in pumping power, and has the advantage of doing the lighter work at an increased speed.

Tests at the Massachusetts Institute of Technology.

The next number of the *Technology Quarterly* will give Part VIII. of the "Results of Tests made in the Engineering Laboratories of the Massachusetts Institute of Technology." The complete tests include duty tests performed by members of the course in mechanical, electrical and chemical engineering and naval architecture on the pumping engine at Chestnut Hill, on the Charleston plant of the West End Street Railway, on the new boilers in the engineering building and on the Babcock and Wilcox boilers in the Rogers Building, recently supplied with Hawley furnaces. In addition, the the various tests of the efficiency of hydraulic and steam apparatus and of the strength of materials are given.

These tests are made by members of all the engineering courses; the articles tested are the full-sized pieces used in actual practice, and the results are therefore of real value to the engineer, architect or designer and to the student.

The tension and compression tests on steel, wrought iron and cast iron were made first on the 50,000-lb. Olsen testing machine, and later on the new 300,000-lb. Emery testing machine. By an ingenious device the amount of distortion produced by a given pressure or tension is directly measured on the material, and the modulus of elasticity obtained. Torsion of twisting tests are made on metal by a machine capable of twisting off a 3-in. wrought iron shaft 21 ft. long. Tests on rope are made in a machine made for that purpose, the strength of the material for different forms of knots being determined. This machine requires a specimen 10 ft. long, and allows for 14 ft. of stretch. Its capacity is 30,000 lbs. The transverse beam tests were made on an 18,000, 50,000 and 100,000-lb. machine. Tests on compression of spruce, yellow pine and oak columns, some with wooden bolsters and some with iron, were made on the 370,000-lb. Emery machine. The columns were from 6 to 10 ft. in length, and between 6 and 10 in. square in transverse section.

An interesting series of eight tests on bolted joints was made, the series being planned so as to secure an increasing compression per square inch in front of the rivets, the object being to find the effect on the efficiency of the joint, and on the tensile strength of the net section of the plate. More recently tests have been made on the strength of triangular hard pine trusses, of framed timber headers, of wires electrically welded and of cast iron water pipe.

Transmission of Power on Naval Vessels.*

BY GEORGE W. DICKIE.

In this paper the author goes somewhat in detail into the different methods of handling both the light and heavy machinery on battleships, the distribution of power of which is divided between electric, hydraulic and pneumatic power. He excludes steam, being the original form in which power is generated, and can be distributed without any reconverting mechanism, and further calls attention to some of the objections to steam in working the machinery, one of the principal being that in time of engagement any leak in the steam pipe may be disastrous to the successful working of the different apparatus. Furthermore, the excessive heat due to steam pipes in those parts of the vessel where pure air should be always circulating, offers a formidable objection.

In regard to hydraulic transmission, he points out

*Abstract of a paper presented at the meeting of the American Society of Mechanical Engineers.

that it has already been used to good advantage in operating the steering gear and the large turrets, and shows that where hydraulic power is now in use on battleships under the care of officers who have had no opportunity to become expert in hydraulic work, and who in many cases do not believe in its application, the record of failure is a remarkably clean one.

Regarding compressed air and electricity, he states that both need to be controlled through an inelastic medium to the same extent as steam does when applied to such work as moving large turrets. Electricity, however, has the advantage of being popular, and the principles of its distribution being quite familiar to young naval officers. Briefly, the author sums up what is now known regarding the present use of the different systems, without drawing many comparisons, but rather recommends the adoption of one method throughout where it is possible.

In this connection it might be of interest to add that the battleship Brooklyn, which is now being remodeled in some of its details at the Brooklyn Navy Yard, is the first battleship to have its large turrets operated by electricity with results that are highly satisfactory and the engineers have expressed their approval of this method.

For a Deeper Channel at New York.

A great effort is being made by the shipping interests of New York to get the work of deepening the ship channel, as contemplated, under way. By the River and Harbor act of June 3 of last year, the Secretary of War was authorized to have surveys and estimates of cost made for a 35 ft. channel from the Narrows to the sea.

The present main ship channel is 1,000 ft. wide and carries 30 ft. at mean low water, and as there are now seven trans-Atlantic steamers which draw between 20 and 30 ft. of water, two that draw from 30 to 31 ft., and one that draws 32 ft., plying between this and foreign ports, besides which there are several vessels being built which will have a draft of from 30 ft. to 32 ft., the necessity of a deeper channel is apparent.

As a result of the surveys authorized last year, the engineer's report states that the net cost of dredging a channel 35 ft. deep and 1,000 ft. wide from the Narrows to the sea would be \$1,740,000. The report also estimates that a channel of the same depth and 1,500 ft. wide would cost \$2,772,000 net, while the cost of a 35-ft. channel 2,000 ft. wide would be \$4,180,000. These estimates respectively include the cost of building the four, five and six additional dredges, at \$100,000 each, which would be needed to do the work. If the work should be done by contract these figures should be increased about 20 per cent. to include contractor's profits and interest on investment.

Considering the moderate cost for which this improvement could be made, remembering that during the last fiscal year over 37 per cent. of the total exports and 63 per cent. of the total imports of the United States passed through the port of New York, shipping men believe that a united effort should be made by the commercial organizations of the port to secure the passage an appropriation in the next River and Harbor bill sufficient to carry out the work. Moreover, it is believed that the matter of making a deeper channel should be got under way as soon as possible, in order that other necessary improvements which are now under consideration by the Lighthouse Board, and the carrying out of which to a measure depends upon any changes that may be made in the harbor, may not be postponed longer than necessary.

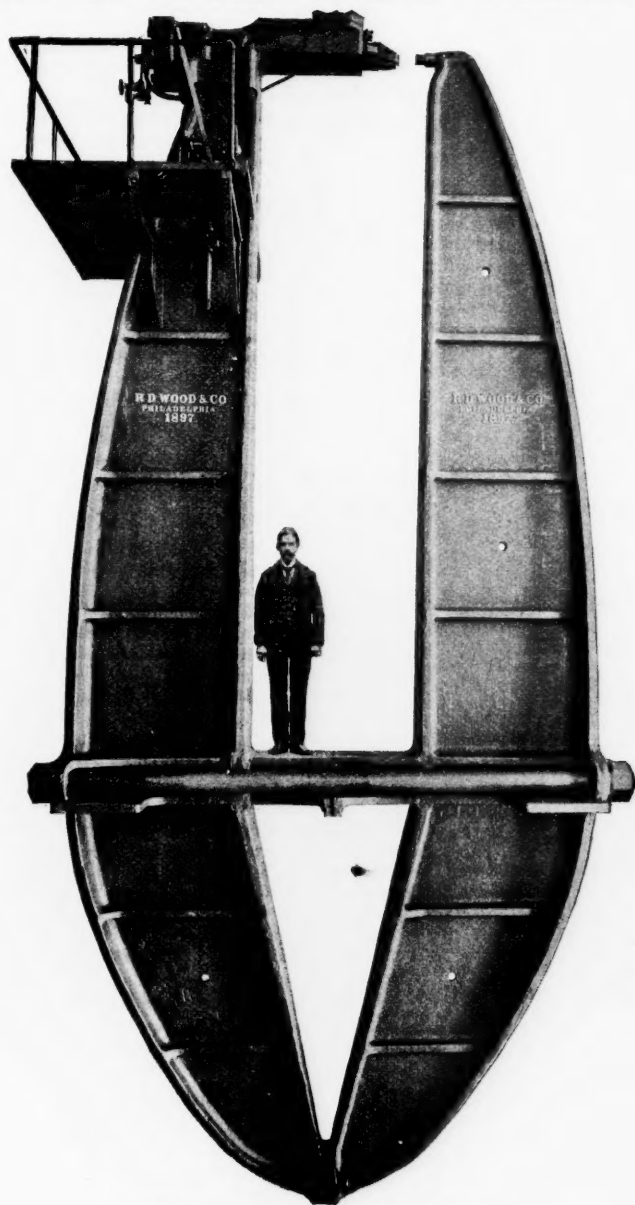
A resurvey of the harbor is now being made which it is expected will be finished in three or four months. When it is completed, the practicability of deepening the east channel, a shorter and more direct route to the ocean than the main ship channel, will be considered. While the marine interests first seek a 35-ft. channel they would also prefer a less complicated and shorter route than the main channel affords, and it will be their endeavor to have a sufficient appropriation made to accomplish one or both of these ends.

Traffic Charts.

On the Saxon governmental railroads there is employed a very practical method of indicating the tonnage of any given material, or of several at once, which passes through that place, also from points of production, the amount of material issuing therefrom. These charts give much better than figures an idea of the relative importance of the various stations, sections and branches from the freight point of view.

While an entire chart would be too complicated to show within the limits of these pages, it is possible to give a good general idea of how the system is carried out by typical imaginary charts on the same general lines.

The tonnage of any one material passing along any given section is indicated by a stripe of a special characteristic color, parallel to the line, and of a width corresponding to the tonnage, this width being expressed on a regular scale given at the foot of the chart. Thus in Fig. 1 we have a representation of the section between Bodenbach (Bohemia) and Dresden, and from there on to Priester witz. The stripe hatched from left to right downwards represents Bohemian brown coal (lignite) carried by the railroad; that on the left side, hatched from right to left, the same material carried on the river in barges. It will be seen that between Bodenbach and Dresden no Bohemian brown coal is discharged from the boats; but



100-Ton Hydraulic Riveter with 17-ft. Gap.

gap, which is wide enough to allow the firebox to swing clear of the inside, a feature patented by Mr. Vauclain, of the Baldwin Locomotive Works, and which has the advantage of putting in a larger number of the rivets (especially those around the firebox and its junction with the shell) than can be done with a narrower gap and flush-top cylinder, such as is the usual English practice. The special features of construction in the working parts are:

(1) The "automatic squaring device," which while not exactly a plate closer works in a somewhat similar manner. It consists of a narrow sleeve surrounding the riveting die, and moving automatically in advance of the riveting die, thus gripping the plate firmly and squaring the work up truly before upsetting begins. The result of using this device is, that truer work is obtained, and greater speed. The entire action of the machine is controlled by one lever and no time is lost in applying the squaring tool. In fact, it saves time by reducing the amount of care to be exercised by the workman in bringing the work truly in line, and is especially advantageous where the work handled is so heavy that the operator cannot easily control its motion.

(2) The machine has also triple power—25, 75 and 100 tons, the change from one power to another being

there are successive deliveries by rail at Schandau, Pirna, etc. Then at Dresden-Altstadt station there is discharge from the boats; also a considerable lessening of the railroad traffic in this material between there and the Dresden-Neustadt station. Here there is met a stream of freight from the west, consisting of so-called Dresden hard coal from the Potschappel mines, but there is also a westward stream of Bohemian coal between Dresden and Potschappel, lessening at Planen. (This is indicated by horizontal hatching.)

At Neustadt there is also met a stream of westbound Silesian hard coal, gradually lessening between Bautzen and Neustadt (see solid black stripe), but there is also a slight eastbound stream of Bohemian coal from Dresden-Neustadt to Radeberg; and Radeberg also receives a westbound stream of the same Bohemian coal from Arnsdorf, which has got it from Pirna by a branch road, and this same branch road sends from Arnsdorf an eastbound stream (lessening in width at each station) to Bautzen.

From Dresden-Neustadt the Potschappel hard coal and the Bohemian soft coal go side by side, each lessening in width at successive stations to Priesterwitz and beyond. From Dresden-Altstadt there is also a stream of Bohemian coal to Coswig, via Cossebande, and so on to Grossenhain and beyond. Between Priesterwitz and a small station south of Grossenhain there is also a small stream of Bohemian coal over a connecting line. The Potschappel hard coal is also seen extending westward to Freiberg, which also gets a northbound stream of Bohemian coal from Moldan, this latter splitting and going west and north in diminishing volume as absorbed by local consumption.

There is also a small north-west-bound stream of Bohemian soft coal from Schandau, on the Elbe, to Niederneukirch, and a tiny strip from here to Bischofswerda, in the Bautzen line. A small stream from Radebeul, on the Elbe, to Radeberg is also shown.

Fig. 2 shows the Potschappel production of hard coal, consumption of that and three other kinds: Bohemian brown coal (left-to-right hatching), Silesian hard coal (double-hatching), and Zwickan hard coal from the West (vertically-hatched stripe). The radius of the stippled circle centering in Potschappel indicates the production of that town in tons as per a scale on the chart.

In Figs. 1 and 2 the distances and tonnages on the proper relative scales are not given, nor are all the various kinds of coal shown on the original chart represented, sacrificing accuracy to clearness, for the purpose of properly showing the principle of these "Graphikons" as the Germans call them.

The idea is applicable to many other purposes in railroad accounting—as, for instance, in showing through and local traffic through and from various stations, freight and passenger business, amount of money spent on stations, permanent way, etc.; gross and net earnings of various sections, actual and proportionate net earnings of different stations, numbers of trains per day passing through a given point or over a given division or subdivision, acreage of given crops properly tributary to each division and station, etc. Steamship companies could show for their various lines the amounts of freight in dollars or in tons, or the nationality of their emigrant passengers, etc. As applied on the State railroads by Geheimrath Köpcke, of the Finance ministry, it has extremely practical value, which is appreciated by the railroad management and by the government.

Foreign Railroad Notes.

The Austrian State Railroads have recently contracted with the mills in the rail pool for a rail supply for the next five years. The amount will be 20,000 to 25,000 tons a year.

The Saxon State Railroads in 1896 had a growth of traffic seldom experienced in so old a country, and which even our railroads would probably be glad to be assured of in 1898. The passenger traffic increased 10 per cent., and the freight traffic seven per cent., while the passenger earnings increased 8½ per cent. and the freight earnings eight per cent.

The completion of a railroad from Wologda, north of Moscow, north to the river Dwina, is followed by the establishment of a steamboat line on the Dwina to Arch-

angel, on the Arctic, giving regular communication for the first time between Central Russia and the north. A great deal of timber and important fisheries may find an outlet by this route.

Even in Austria it seems that the railroads sometimes make overcharges. In Vienna a man who had been an employee in a railroad freight office set up as an expert to examine freight bills and collect overcharges for shippers, charging 30 to 50 per cent. of the sums recovered. He attracted many customers, and was doing a good business, when it was discovered that in many cases he retained not only the percentage which he charged for his services, but also a great part of what was due the shipper, who was generally satisfied if he got anything. In one case where he recovered for a client \$3,000 he paid him only a few hundreds. He is now languishing in jail.

At a convention of German railroad employees recently a protest was presented to the Minister of Justice and the Minister of Public Works concerning the execution of the laws punishing by imprisonment railroad men who have by negligence endangered transportation. They say that no other class of men are subject to such

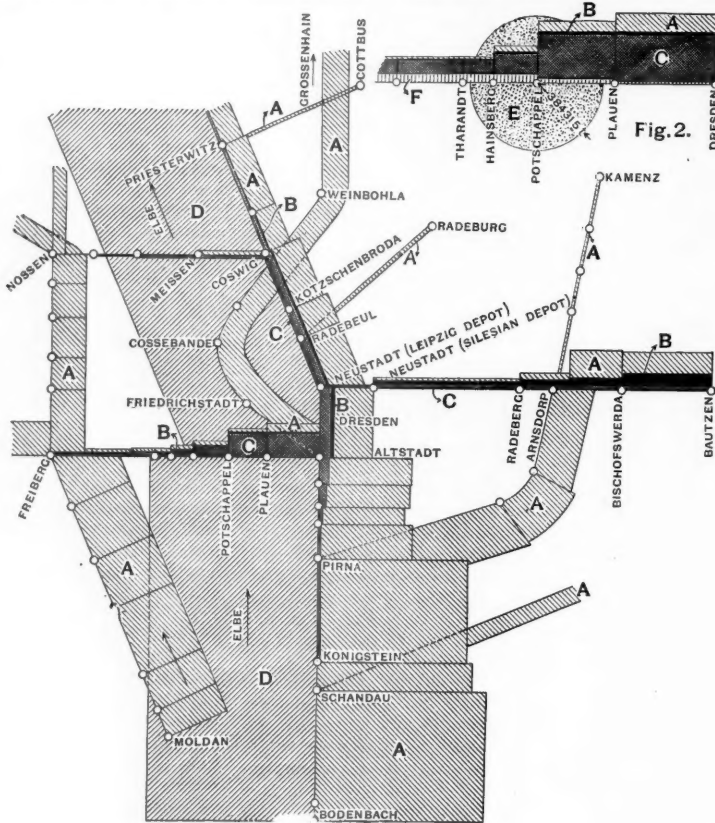


Fig. 1.—Traffic Chart.

punishment, to anything like this extent, and that numerous capable and careful men have not been able to escape it, "as it may easily happen that a man in the pressure of his duties or in a specially difficult situation may neglect to follow some rule or may do something the wrong way." Of the 7,000 employees represented 69 had been prosecuted under this law in 1896. The convention asks that the less serious cases be not prosecuted, and further, that the men called to testify as experts be chosen from an administration different from that on whose lines the accident occurred.

TECHNICAL.

Manufacturing and Business.

The Davis & Egan Machine Tool Co., of Cincinnati, O., has just received an order for a special combination turret lathe, through its Amsterdam Office, for the Netherlands government. The machine will be shipped about January 15.

The Schenectady Locomotive Works of Schenectady, N. Y., are building an addition to their shops, to be used for building tanks and tenders. It will be 76 x 280 ft. and equipped with a 40-ton overhead traveling crane.

A. F. Yarrow, of Yarrow & Co., Poplar, London, now traveling through the United States, on his recent visit to Cincinnati, placed an order with the Davis & Egan Machine Tool Co. for several of its latest style machines.

At a meeting of the Directors of The Q & C Co., of Chicago, held in New York City last week, Charles F. Quincy was elected President and Treasurer of the company.

P. F. Carroll has been appointed Receiver of the Litchfield Car & Machine Co., of Litchfield, Ill., to fill the vacancy caused by the death of P. B. Urdike, of Litchfield.

Frederick Snare, Secretary of the Pencoyd Iron Works (A. & P. Roberts Co.), has removed his headquarters from Philadelphia to the American Surety Building, 100 Broadway, New York City. The company will also, on Dec. 15, open an office of its own in the Brazer Building, 27 State street, Boston, Mass. It will be in charge of Wm. B. Ogram, Sales Agent.

The Hewitt Steel Truck Co., of Buffalo, N. Y., has been incorporated under the laws of New York State with a capital of \$500,000 to make car trucks and couplers. The directors are John J. Albright, Edmund P. Hayes and Herbert H. Hewitt, of Buffalo.

The McCord journal box and lid, made by McCord & Co., Old Colony Building, Chicago, has recently been specified on 200 cars for the Kansas City, Fort Scott & Memphis, 300 for the Chicago Great Western, 100 for the Chicago & West Michigan, 100 for Swift & Co., 150 additional for the Iowa Central and 10 of 80,000-lbs. capacity for the New York Central & Hudson River.

Security car doors, made by the National Railway Specialty Co., of Chicago, are specified on 250 cars for the Illinois Central and on 100 cars for the Missouri Pacific, which are being built by the Missouri Car & Foundry Co.

We are informed that the Ordnance Department of the United States Army, after a number of tests, has adopted the Superior graphite paint, made by the Detroit Graphite Mfg. Co., of Detroit, Mich., for all paint required on heavy ordnance and gun carriages.

The Alexander Car Replacer Company is making its re-railing device, for roads having heavy equipment, of ½-in. steel, of the same size and pattern as its regular ¼-in. replacers; prices the same. They now have 6,000 pairs in service, and on many roads this device is part of the regular train equipment.

The Standard Railway Signal & Switch Co., of Omaha, Neb., has been incorporated under the laws of Nebraska with a capital stock of \$1,000,000 for the purpose of making and selling signals and switches. The incorporators are James H. Winspear, John M. Thurston, Charles A. Potter, Melvin H. Redfield and Fred R. Smith.

The Dickson Locomotive Works will, on Dec. 15, move its New York office from 100 Broadway to 40 Wall street.

The Middlesboro Foundry & Machine Works, of Middlesboro, Ky., will spend \$100,000 in buying new machinery to replace some recently destroyed by fire.

The Foxboro Foundry & Machine Co., of Foxboro, Mass., whose building was recently destroyed by fire, will rebuild. The main foundry building, which is about 80 ft. wide and 140 ft. long, is being replaced by a steel frame structure. A traveling crane runway for handling materials in the building is being arranged for, and provisions are also being made for suitable jib cranes. The steel framework is being furnished and erected by the Berlin Iron Bridge Co.

The Foster Engineering Co., of Newark, N. J., makers of pressure regulators and reducing valves, reports increased activity in its business. The company has just closed a contract for 63 valves for the three United States battleships now being built at Newport News, and the Japanese and Brazilian cruisers, Kasegi and Nichtheroy, are being equipped with the Foster regulator. A large number of the United States government's vessels are equipped with the company's valves, and a list of these and a large number of ocean, coastwise, lake, river and harbor vessels thus furnished, with the names of the owners and builders, has just been prepared and will be sent on application to all interested.

Charles T. Means has been appointed Agent and Treasurer of the Manchester Locomotive Works, of Manchester, N. H.

New Stations and Shops.

The Bennington & Rutland Railroad has awarded a contract to H. Mellen & Sons, of Worcester, Mass., for building the new passenger station at Bennington, Vt. It will be 100 x 40 ft., one story high, of Woodbury granite, with a shed 200 ft. long.

The Chicago, Burlington & Quincy has asked for bids on a new freight house to be built between Harrison and Taylor streets, adjoining its tracks at Chicago. There will be a two-story office building at one end while the freight house proper will be one story high, built of brick on masonry and concrete foundations. The roof construction will be of wood and the roof covering will be tar and gravel.

The Atchison, Topeka & Santa Fe is soon to rebuild its passenger station at Houston, Tex., and will put up a building which will cost about \$4,000; but this work is in the nature of repairs rather than of entirely new construction. Nothing has as yet been decided regarding improvements at Fort Worth.

M. C. B. Circulars of Inquiry.

The Master Car Builders' committee on Steel Car Framing, consisting of Messrs. A. E. Mitchell, W. P. Appleyard and Wm. Forsyth, asks for the following information:

1. If you have had any steel car frames in use, please describe all the important facts about them which your experience has brought forth, and furnish working drawings illustrating the frame.
2. Which do you consider preferable for the members of the car frames, rolled shapes of standard commercial sizes or special pressed shapes?
3. Which do you prefer, a car frame made entirely of steel or a composite frame made of steel and wood?
4. What parts do you recommend be made of wood?

5. What is your opinion of the advisability of using truss rods under side sills of steel bar frames; give the reasons for your opinion?

6. Do you recommend that the draft gear of steel car frames be located between center sills and firmly secured to them, or the use of independent draft timbers below the center sills, similar to the construction which is now generally used on wooden cars?

7. Which do you recommend, wooden or steel side and end sills, and what are your reasons therefor?

8. Please give maximum light weight of car per ton (net 2,000 lbs.) you would recommend for each ton of paying freight.

9. Recognizing the fact that steel car framing will be used in cars of very large capacities, what type of center plate would you recommend, and what maximum bearing pressure per square inch would you recommend for carrying the car and lading?

10. What type of side bearing would you recommend for cars of large capacities with steel car framing?

Replies should be sent not later than Dec. 25, 1897, to Mr. A. E. Mitchell, Chairman, 21 Cortlandt street, New York City.

The committee on the subject of Rust from Salt Water Drippings, consisting of Messrs. Samuel Higgins, A. M. Waitt, and Thos. Kirby, requests the following information:

1. The approximate number of refrigerator cars loaded with dressed beef that are handled per year on your road.

2. Is the dripping of salt water from these cars causing any appreciable damage to the car trucks, track, bridges or signal bond wires?

3. If so, what do you think is the best way to dispose of the salt water so as to prevent its injuring the parts referred to? If any member has tried to retain the salt water in a tank or reservoir underneath the car, the committee would like to have a blue-print of the arrangement that has been tried.

Replies to this circular should be forwarded to the Chairman of this committee, Mr. Samuel Higgins, at South Bethlehem, Pa., not later than Feb. 1, 1898.

Rapid Transit in New York.

At a recent meeting of the Rapid Transit Commission (New York) President Orr announced that, acting under a resolution of the board authorizing him to appoint two civil engineers and a real estate expert to consider detailed plans and specifications for the construction of the underground railroad, he had designated as such engineers George S. Mcrison and Howard A. Carson, and as such real estate expert James L. Wells.

It was decided by resolution that the Inspectors to be chosen to inspect the work of construction of the underground road where it may interfere with sewers, water pipes and other sub-surface structures of the city are to be appointed on the nomination of or after consultation with the Commissioner of Public Works, and that it shall be the duty of these Inspectors to act in behalf of the Commissioner as well as of the board.

The Nicaragua Canal Commission.

Although we have used due diligence and reasonable self-restraint in our effort to chronicle the movements of the Nicaragua Canal Commission up to date, we have made at least two misstatements, one that Major Livermore was to go as one of the Commissioners, and last week that Mr. E. S. Wheeler had been appointed Chief Engineer. The reader cannot possibly imagine the number of misstatements that we might have made and did not make. Now we are probably safe in saying that the Commission sailed for Nicaragua last Sunday in the gunboat Newport and that it sailed without Mr. Wheeler and so far as we know without a Chief Engineer in charge of surveys, other than Professor Haupt and Mr. Menocal, who can hardly be called a disinterested person. The fact is there is a long and complicated history to be written about this Commission, but perhaps it is as well to leave that history unwritten for the present.

We are informed that Mr. L. Y. Cooley has gone to Nicaragua as guide, philosopher and friend for a party of possible contractors who will look over the ground.

Chicago Sewerage.

At a meeting held Dec. 1 Mayor Harrison and the Trustees of the Sanitary District, Chicago, agreed on a plan of intercepting sewers to carry the sewage of the city into the river instead of the lake as at present. In general this plan provides for building a 20-ft. sewer in Thirty-ninth street, which will carry 40,000 cu. ft. of water a minute and a 16-ft. sewer in Lawrence avenue carrying 35,000 cu. ft. It is expected that a gravity flow can be obtained in the Thirty-ninth street sewer, but that pumps will have to be used for the one in Lawrence avenue. No definite agreement has been made in regard to connecting the present sewer system with the two main sewers. It is likely that two connecting sewers will be built along the lake shore, one on the north and one on the south side, into which the present sewers will empty. The original cost of building the main sewers will be borne by the City of Chicago and the cost of maintenance by the Sanitary District.

THE SCRAP HEAP.

Notes.

The station agent of the Long Island Railroad at Bayport has received a prize of \$50 for the best kept station building and grounds for the season of 1897. The second prize, \$25, went to Central Islip and the third, \$15, to St. James.

President George C. Smith, of the Atlanta & West Point, tells a reporter that the loss to his road by the suspension of traffic in consequence of the yellow fever since Sept. 6 is about \$100,000. This includes a considerable sum which was spent for disinfecting cars and freight.

Superintendent F. G. Darlington, of the Pennsylvania lines, at Indianapolis, has issued an order that baggage-men of passenger trains must not leave their cars to throw switches. Such work of this kind has heretofore

been done by baggagemen must be done either by the fireman or a brakeman.

The steamer George W. Morley was destroyed by fire near Evanston, Ill., Dec. 5. The steamer was cut loose from its tow, and run ashore in time for the crew of 14 officers and men to escape. It was owned by Hawgood & Avery, of Cleveland, was rated in the highest class, and was insured for \$50,000.

On the Pittsburgh, Fort Wayne & Chicago one day last week a special officers' train, consisting of an engine and four cars, was run from Pittsburgh to Chicago, 468 miles, in 10 hours 2 minutes, and the same train made the return trip in 9 hours 25 minutes, whereupon reporters expatiate at length on the probability of a regular train over the Pennsylvania between New York and Chicago in 20 hours.

The Illinois Central has adopted Brown's discipline on the Chicago, St. Louis, Amboy and Springfield divisions. A reprimand will be extinguished by a clear record of three months; five days of suspension will be extinguished by a clear record of nine months; thirty days will be extinguished by a clear record of one year, and sixty days by a clear record of 18 months.

A press despatch from San Francisco says that Manager Fillmore, of the Southern Pacific, has determined to discontinue the practice of holding his trains at Ogden for eastern connections when they are late. He says that trains coming into Ogden are habitually two or three hours late, because the roads make impossible schedules, and that the Southern Pacific has to make up the lost time. He says that these unsatisfactory schedules must be altered or he will let the passengers wait over one train at Ogden.

The Montreal Star publishes a report from Moncton, N. B., asserting that since the present Liberal government of Canada came into power, a year and a half ago, about 200 employees of the Intercolonial Railway have been dismissed for political reasons. The number of men in different departments is, specified as, for instance, two district superintendents, one chief engineer, a half dozen other higher offices, 31 section foremen, six station agents, etc. In a considerable number of cases the length of the man's service, 15 years, 25 years, 30 years, etc., is specified.

Disposal of Garbage in Chicago.

Contracts were awarded in Chicago, on Nov. 29, by Mayor Harrison for the disposal of garbage for the next five years. The city was divided into four districts and bids invited on each district as well as for the city as a whole. The contract was let by districts instead of for the entire work, the lowest bidder being selected in each district, as follows:

No. of Dis.	Location.	System.	Contractors.	Amount.
1	North Side.	Merz.....	Mulcaire & Burke.	\$350,000
2	South Side.	Chamberlain.....	Dowdle & Chamberlain.	790,000
3	West Side, south of Madisonst.	Flinn.....	Hanrahan & Downey.	349,312
4	West Side, north of Madisonst.	Merz.....	Mulcaire & Burke.	384,509
Total.				\$1,873,821

Ten days are given the contractors in which to file their bonds of \$200,000 each, and it is expected that all the bonds will be filed at once. Existing contracts will be extended until the new ones go into effect, which will be March 1, 1898. It is expected that better results will be obtained by dividing the contract, and that the city will be in better position to get the next contract on reasonable terms than if one firm did all the work. The Flinn system is used in Pittsburgh, the Chamberlain system in Detroit and the Merz in several smaller Eastern cities.

Railroading Reduced to its Lowest Terms.

Thursday morning a train left the Lebanon Springs railroad shops at Chatham for Berlin, where the work of putting that section of the road in condition for traffic between that point and Petersburg Junction will at once begin. A subscription fund was recently raised to purchase 1,500 ties. The ties have been purchased and labor has been freely volunteered to put them in position. Two round trips will be made each day at a speed not to exceed eight miles an hour.—Hudson (N. Y.) Register, Dec. 3.

An order of Justice E. L. Fursman, of the Supreme Court, authorizing Elnathan Sweet, Receiver, to operate the section between Petersburg and Berlin, has been filed in the County Clerk's office at Troy. The section of road between Chatham and Petersburg is spoken of in the papers included in the order as being unsafe for travel, the principal danger being in the insecure bridges and decayed ties. The State Railroad Commission has given permission to operate between Berlin and Petersburg, as soon as the road has undergone needed repairs; but trains must not be run faster than eight miles an hour.

New Dry Docks and Vessels for the Navy.

On Dec. 7 Senator Hale, of Maine, introduced a bill providing for the building of dry docks at Portsmouth, N. H. (\$1,000,000); Boston, Mass. (\$1,350,000); Algiers, La. (\$500,000); and Mare Island, Cal. (\$500,000), and for enlarging the docks at Brooklyn, N. Y. (\$286,556); League Island, Pa. (\$286,556); and Norfolk, Va. (\$160,000), and for building a wharf alongside the timber dry dock at Port Royal, S. C. (\$75,000). The bill also provides for the addition of a first-class seagoing coast-line battleship, at a cost not to exceed \$3,750,000; six seagoing torpedo boats of 175 tons displacement, at a cost of \$1,125,000, and three torpedo boats of greater speed, at a cost of \$900,000. It is provided that the battleship shall be primarily for coast defense and that it shall carry the heaviest armor and most powerful ordnance and have a displacement of 11,500 tons. The bill is based on the recommendations made in the last annual report of the Secretary of the Navy, referred to in our last issue.

The Department Store and the Union Loop.

One of the large department stores in Chicago, with an entrance on Wabash avenue, has built a passageway from its second floor to the new Union Elevated Loop near the Madison street station. The franchise of the Loop Company permits such connections, but as considerable opposition has developed on the part of the smaller retail merchants to these passageways, no others will be permitted until the matter is settled. A petition to the Council has been prepared asking that the one already finished be ordered removed, and it is probable that the question will have to be settled by the courts eventually. Meantime a ticket office for all elevated trains has been established at the new entrance, and on Nov. 23, the first day it was open to passengers, 232 persons took trains on the South Side Elevated from the store. A great objection to the elevated roads with many people is the climb up the long flight of steps, but as the entrance to the Loop from the store is reached by eight passenger elevators, it is likely to prove a popular way of taking elevated trains. The bridge is of ornamental ironwork and glass.

Chicago River Improvement.

The question of improving the Chicago River by lowering the tunnels used by the street railroads, and by removing the center piers of the bridges in order to widen and deepen the river and make it navigable for the larger vessels now in service on the lakes, is receiving much attention in Chicago, and numerous meetings have been held to discuss the matter. On Nov. 26 representatives of the city administration, the city Council, the Illinois Congressional delegation and the Chicago River Improvement Association were chosen to prepare a memorial to Congress praying the passage of a bill to deepen the channel of the river. This committee consists of Mayor Harrison and Commissioner of Public Works McGann, of the city administration; Congressmen Lorimer and White, Capt. J. S. Dunham, J. F. Tracy and, ex-Congressman George E. Adams, of the Chicago River Improvement Association, and five Aldermen of the Council Committee on Rivers and Harbors. Alderman Miller is chairman of this committee, which will meet this week to prepare the memorial. The exact sum which will be required for the work has not been settled, but it is estimated that about \$3,000,000 will be needed.

"A Railroad Invention."

(From a "Special Telegram to the Toledo Blade.")

"David Kemp, a Clover Leaf engineer, has perfected an invention composed of angling mirrors to be arranged in the cab of an engine so that the engineer may have a clear view of the train behind him in the day time and see the red lights at night without turning around."

As the historical editor is off resting at the seashore just now, we are unable to say whether it was in 1847 or in 187 that mirrors were first thus used in cabs; but it was somewhere along there. We publish this item as a useful bit for those who wish to estimate how often "inventions" have to be reinvented. It is also interesting as a shining example of the "Special Telegram" now in the full flower of perfection in many newspapers. The last example of this kind that we recall was one in a New York paper, a few days ago, apprising the world of the startling fact that if the name of the New York, New Haven & Hartford should be changed, President Clark would be found to be in favor of calling it so and so. There was no doubt of it, for the reporter had good evidence that once on a time Mr. Clark had actually spoken on the subject.

"In Interference" with Frank Stockton.

Keely is building a flying machine. So far as the inventor has explained it, the new machine is built with the idea, first advanced by the Hon. John Brisben Walker several years ago, that the first step for a successful flying machine is to do away with the force of gravitation. This is part of Mr. Keely's explanation of the principle on which his invention is based: "In what we have been taught in gravitation by Sir Isaac Newton and other illustrious physicists I find the opposite force, levitation. In other words, this machine will be capable of making a sympathetic outreach of a distance great enough about itself to not only neutralize the effects of gravitation, but to permit the engine and its equipment to keep it. Experiments which I have made show me clearly that levitation is the opposite of gravitation, and that I have fully overcome it."—New York Sun.

The learned reader will remember that Frank Stockton discovered negative gravity a dozen years ago, and levitation is a distinct infringement. Probably the sympathetic outreach is patentable in this combination, although not new in itself.

Courtesy in Humble Places.

Some of the German railroads are introducing an automatic slot machine by which the passenger can get himself a ticket without having it jerked at him as one would throw a bone to a dog.—Daily Paper.

A Foggy Editor.

Mr. Gabriel Leverich writes to the New York Sun, saying that the Evening Post has said editorially that with a tunnel road New York travelers would not be troubled by fogs; that he has explained to the editor of the Post that a fog may be worse in a tunnel than on the surface, and that so far his letter has not been printed in that candid journal. Mr. Leverich need not be surprised; his experience must be very common. Three weeks ago we asked the able editor how he proposed to keep fog out of a tunnel, but have had no answer.

Electric Railroads In and Near St. Etienne.

Consul H. S. Brunot of St. Etienne, France, sends the following, dated Oct. 21, 1897: "Several new lines of electric street railroads have just been voted by the municipal council of this city. These enterprises may afford good opportunities to our electric-plant builders to propose their machinery to the contractors on these lines. The names of the probable contractors are M. Cuffinhal, electric engineer, St. Etienne, and M. Buffaud, Rue Hotel de Ville, Lyons.

Lectures at Purdue University.

Gen. John W. Noble, ex-Secretary of the Interior, lectured to the students of Purdue University, Dec. 1, on the subject, "The Mutual Obligations of Railroad Corporations and the People."

The Chicago Idea.

At the meeting of the Council Committee on Harbors and Viaducts, Mr. Yerkes (the street railroad Yerkes) said that the days of makeshifts for Chicago are past. Chicago must maintain her position as a great inland seaport. This could never be done with a river harbor, and he cited the decline of Philadelphia as a seaport to prove the inadequacy of a river. The city has on the lake front something like 6,000 ft. of land. I would there build 20 piers, each running a mile into the lake. This would give the city 20 miles of dockage. Outside of

these I would build a breakwater, leaving a safe basin for vessels to run into. If the piers and breakwater were well and permanently built Chicago would have a harbor unequalled by any city in the world. To do this a company with a capital of \$50,000,000 could be formed. I would have the city reserve the right of buying back these docks 50 years later at the actual cost of the work.

The West End Lease.

In the last paragraph of the article on the West End Lease appearing in our last issue reference was made to the report regarding the new proposition which the officers of the Boston Elevated Railway Company had made. This report has been confirmed and in place of the 99-year lease on a dividend basis of 8 per cent. the directors have agreed to recommend a lease similar in general scope to the original one, but substituting a 25-year tenure and a 7 per cent. dividend. A special meeting of the stockholders of the West End Street Railway Co. will be held Dec. 9 to ratify the action of the directors.

Railroads in Nicaragua.

The Congress of Nicaragua has authorized the government to sell or lease the National Railroad. The President decided to send a commissioner abroad to make the necessary negotiations, and this commissioner will be sent to the United States first. A United States Consul says that it will take not more than \$100,000 gold to bring the National Railroad of Nicaragua in perfect order. This road will probably be followed by the construction of the road to the Atlantic by the same company. Nicaragua would give liberal concessions for the continuation of the road to the Atlantic coast.

New Branch Hydrographic Office at Buffalo.

On Nov. 22 a new branch hydrographic office was opened at Buffalo, at 1344 Guaranty Building. This office was opened in accordance with a clause in the last naval appropriation bill, and is intended to render assistance to masters and owners of lake vessels by giving early information regarding the position of wrecks, misplaced buoys, new shoals and other practical information. The officer in charge is Ensign C. T. Jewell, assisted by Mr. J. C. P. de Krafft, who was transferred from the Hydrographic Office at Washington, where he has had charge of all lake charts. Branch hydrographic offices have for some time been maintained at Chicago and at Cleveland, and last year Congress made appropriations for three new offices, one at Buffalo, one at Sault Ste. Marie and one at Duluth, so that in the future there will be five branch offices instead of two.

LOCOMOTIVE BUILDING.

The Chicago, Buffington & Cincinnati is about to order 10 new locomotives.

The Mobile, Jackson & Kansas City Railroad will probably order two new locomotives in the near future.

The Southern Indiana has placed an order with the Baldwin Locomotive Works for three passenger locomotives.

The Pittsburgh Locomotive & Car Works deny that they have received an order for five locomotives from the Detroit & Lima Northern, as reported in a number of papers.

The Richmond Locomotive & Machine Works have commenced delivery of the new consolidation locomotives ordered by the Chesapeake & Ohio, and noted in this column Sept. 3.

The Grand Trunk is reported as about to place orders for 40 more locomotives with locomotive building firms in the United States, but the report could not be confirmed at time of going to press.

The Schenectady Locomotive Works have received an order to build two additional mogul locomotives for the Grand Trunk, with 20 x 26 in. cylinders, making the present orders from that road 10 engines in all, six moguls and four 20 x 26 in. cylinder passenger engines.

The New England Railroad has placed an order with the Schenectady Locomotive Works for one eight-wheel passenger locomotive for use on the five-hour train between New York and Boston. It will have 19 x 24 in. cylinders and driving wheels 6 ft. in diameter, with cast steel centers.

The Shreveport & Red River Valley Railroad, now being built from Shreveport to Coushatta, La., 64 miles, is reported as being in the market for locomotives. William Beenborn, President of the White Cliff Cement Co., of Chicago, and W. C. Taylor, of Shreveport, La., are interested in the new road.

The New York, New Haven & Hartford Railroad has placed an order with the Schenectady Locomotive Works, of Schenectady, N. Y., for 10 mogul locomotives with 20 x 28 in. cylinders. These are to be duplicates of 10 which were built by the Schenectady Locomotive Works for the same road last year.

The Kansas City, Pittsburgh & Gulf has placed an order with the Baldwin Locomotive Works for 15 10-wheel locomotives. They will have 20 x 26 in. cylinders, 54-in. driving wheels and weigh about 150,000 lbs., with 115,000 lbs. on the drivers. The boilers will be 64 in. in diameter with 300 flues 13 ft. long; firebox, 108 in. long; total wheel base, 24 ft. and rigid wheel base, 14 ft.; tank capacity, 4,000 gals.

The Brooks Locomotive Works of Dunkirk, N. Y., are building one mogul engine for the Reynoldsville & Falls Creek. It will have 19 x 24 in. cylinders, 50 in. (outside diam.) driving wheels with open-hearth steel tires 3 in. thick, and weigh in working order 124,000 lbs., with 108,000 lbs. on the drivers. The boiler will be Belpaire type, 60 in. diam., with tubes 2 in. in diam., No. 12 wire-gage, lap-welded charcoal iron; firebox, 108 in. long and 32 1/2 in. wide. The engine will have a two-wheeled radial and swing truck, with 28-in. cast iron spoke wheels, and the tender will have a capacity of 4,000 gals. of water and about seven tons of coal. The locomotive will be equipped with A. French Spring Co.'s springs, Jerome metallic packing, 3-in. Kunkle safety valves, '88 Monitor injectors, New York air brakes for driver, tender and train service, with No. 2 pump, Trojan M. C. B. couplers for pilot and rear of tender and sandboxes equipped with the Leach track sanding apparatus. The boiler and firebox steel will be furnished by Park Bros. & Co., the staybolts by Brown & Co., Incor., Pittsburgh, and the piston rods and crankpins will be of open-hearth steel from Pennsylvania steel billets.

In our last issue we referred to an order for six six-wheel switching engines placed with the Brooks Locomotive Works, of Dunkirk, N. Y., by the Cleveland, Cincinnati, Chicago & St. Louis. These locomotives will have 19 x 24 in. cylinders, 50-in. (outside diameter) drivers and weigh in working order 106,000 lbs. The boiler will be of the radial stayed straight top type, 60 1/2 in. in diameter, with tubes 2 in. in diameter; firebox, 103 in.

long and 33 1/2 in. wide; tender capacity 3,500 gals. of water and about six tons of coal. The locomotives will be equipped with Krupp crucible steel tires, 3 in. thick; A. French Spring Co.'s springs, Magnesia sectional boiler covering, No. 8 Monitor lifting injectors, 3 1/2 in. Kunkle safety valves, Jerome metallic packing and Westinghouse automatic brakes for tender and train service with American outside equalized driving-wheel brakes and Westinghouse train signal. The boiler and firebox steel will be furnished by the Carbon Steel Co., of Pittsburgh; the staybolts of Tennessee bloom iron, by the Ewald Iron Co., St. Louis, Mo.; bearing metal, phosphor bronze, by the U. S. Bronze Co., and piston rods, axles, main and parallel rods and crankpins to be of steel from billets by either Midvale Steel Co., Otis Steel Co. or Cambria Iron Co.

CAR BUILDING.

The Pittsburgh, Bessemer & Lake Erie is in the market for 100 box cars.

Murray, Dougall & Co., of Milton, Pa., are building three cars for the Puento Oil Co.

The South Baltimore Car Works is building 100 cars for the Black, Sheridan, Wilson Co.

The Dora Furnace Co., Pulaski, Va., is in the market for 25 gondola cars of 60,000 lbs. capacity.

The Missouri Car & Foundry Co. is building eight cars for the American Brewing Association.

The Mobile, Jackson & Kansas City Railroad will probably require in the near future six passenger and 50 box cars.

The Jacksonville & St. Louis has placed an order with the Mt. Vernon Car Works, of Mt. Vernon, Ill., for 50 coal cars.

The Indiana Tank Line has placed an order with the Wells & French Co. for the 10 tank cars noted in this column last week.

The Southern Indiana has placed an order with the Barney & Smith Car Co., of Dayton, O., for 150 flat, 50 coal and 25 box cars.

The Chesapeake & Ohio has ordered one combination smoker and baggage car from the Pullman Co. for use on its F. F. V. limited train.

The Shreveport & Red River Valley Railroad, referred to in the Locomotive Building column, is reported as being in the market for new freight and passenger cars.

The Boston & Maine has placed an order with the Locomotive Co., of Laconia, N. H., for 500 freight cars. These works have been idle for some time and will be put in operation at once.

The Atlantic, Valdosta & Western, referred to in the railroad construction column, is in the market for 50 flat and 10 box cars. G. S. Baxter, chairman of the Executive Committee, 18 Wall street, New York City, will buy this material.

The Brooklyn Elevated Railroad will place an order for 50 passenger cars within the next two weeks to be electrically equipped for use on the New York & Brooklyn Bridge. It is not likely that bids will be called for, as the order will probably be given to Pullman's Palace Car Co.

The Terre Haute & Indianapolis is about to contract for 100 "X G" box cars with the Pennsylvania Railroad standard arch bar truck, with pressed steel body and truck bolsters, Janney couplers, Westinghouse airbrakes National hollow brakebeams, Wagner car doors, Winslow roofs, and Pennsylvania Railroad standard M. C. B. axles, journal boxes and bearings.

The Columbus, Hocking Valley & Toledo has placed an order with the Ensign Mfg. Co., of Huntington, W. Va., for 100 box cars of 60,000 lbs. capacity and 38 ft. 4 1/2 in. long over end sills. They will be equipped with Bittendorf truck and body bolsters, Chicago roofs, Security side doors, Hoey drawbar attachments, Buckeye couplers, Westinghouse air-brakes, Sterlingworth brakebeams, McCord journal boxes and lids, Hoey dust guards for brakes, Tins dust guards for wheels, McGuire grain doors, Dayton door locks and steel axles. The road has also ordered 150 box cars from the Barney & Smith Car Co., of Dayton, O., and 200 from the Michigan-Penninsular Car Co., of Detroit, Mich.

The Benwood & Southern Electric Railroad, extending from Benwood to Maundsville, W. Va., eight miles, will buy a complete new outfit of winter cars. The road has been taken out of the hands of a receiver and reorganized.

BRIDGE BUILDING.

Almonte, Ont.—A new bridge will be built over Waba Brook, on the boundary between Pakenham and Fitzroy.

Birmingham, Ala.—It is stated that on Nov. 22 the State Board of Railroad Commissioners met at this place, condemned the bridge of the Birmingham & Atlantic across the Coosa River, and suggested that the railroad not repair the present one, but build a new structure.

Cambridge, Mass.—The Board of Aldermen has authorized Mayor Sortwell to petition the legislature for such legislation as will authorize the building and maintenance of a new bridge across the Charles River in place of the so-called West Boston bridge. The cost of the bridge will be paid by the Boston Elevated Railway Co., the cities of Boston and Cambridge and several neighboring towns, and in such proportions as the legislature shall determine.

Canastota, N. Y.—A new bridge is contemplated to replace the present Peterboro street structure. The legislature will be petitioned to build a lift bridge. J. W. Wilson is one of the committee having the matter in charge.

Cortland, N. Y.—Reports state that the Groton Bridge & Mfg. Co. has received the contract for a new bridge to be built over the Tioughnioga River, at Rickard street.

Fallsburg, N. Y.—It is said that a 200-ft. bridge, with two piers, will be built over the Neversink, at Denison Ford.

Franklin, Pa.—The Grand Jury has reported in favor of a county bridge over Spruce Run, in Scrubgrass Township.

Little Falls, N. J.—The Board of Chosen Freeholders has authorized the Committee on Bridges to adver-

tise for bids for building a new iron superstructure and extending abutments of the bridge over Slippery Rock Brook, on New street, at a cost not to exceed \$1,200.

Manor, Pa.—The Court has approved the building of a bridge on the Harrison City road between here and Penn Township. It is to replace the one washed away two years ago.

Middletown, Ia.—It has been decided to replace the old wooden bridge between here and Heno with a new iron one.

Montreal, Que.—It is said that the Atlantic & Lake Superior has bought 230 lots in Longueuil, opposite here, for the terminus of its proposed bridge across the St. Lawrence River.

New York.—On Nov. 30 bids were opened for a viaduct to be built over the Harlem Railroad and its Port Morris Branch, connecting Melrose and Webster avenues, and the contract has been given to Messrs. Stephens & O'Rourke, at their bid of \$164,051. Other bidders were: King Bridge Co., \$194,560; O'Brien & McHale, \$170,160; R. H. Hood, \$182,419; W. J. Rogers, \$164,324; J. A. Flynn, \$185,813; Elmira Bridge Co., \$167,437; Manhattan Construction Co., \$178,974.

On Dec. 2 tenders for four bridges crossing Gerard and Walton avenues, River avenue and the New York Central Railroad, Fort Independence street, and the New York & Putnam Branch of the New York Central were received as follows: A. C. Gildersleeve, \$82,619; J. A. Flynn, \$84,452; O'Brien & McHale, \$84,770; W. J. Rogers, \$84,931; Stephens & O'Rourke, \$86,208; Grattan & Jennings, \$97,843; King Bridge Co., \$98,388, and R. H. Hood, \$99,844.

The Secretary of War has given the New York Central permission to build a temporary pile trestle across the mouth of Spuyten Duyvil Creek to be used while the new permanent bridge is being built.

On Dec. 7 the Board of Estimate and Apportionment approved the plans for the extension of the Riverside Drive across Manhattan Valley to 134th street and bids for the steel viaduct will be asked for at once. The structure will be 1,564 ft. long and 60 ft. wide. The approaches will be 480 ft. long, making the total length of 2,044 ft. The roadway will be 95 ft. above the water at 127th street and 75 ft. above it at 135th street.

Quincy, Ill.—Plans have been approved by the Secretary of War for a new bridge to be built across Quincy Bay by the Chicago, Burlington & Quincy.

Trenton, N. J.—County Engineer Epple, it is said, has been directed to prepare plans for a low truss iron bridge over Eight-Mile Run.

Valparaiso, Ind.—It is said that bids are asked Dec. 31 for building a bridge across Coffee Creek in Jackson Township. Jas. S. Fulton, Chairman Board of County Commissioners.

Williamsport, Pa.—The Grand Jury has recommended the building of a 120-ft. bridge on the road from Montoursville to Warrensville, at a cost not to exceed \$2,200; and also the building of a bridge over Larrys Creek, in Cogan House Township, not to cost over \$1,500.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Albany, quarterly, 2 per cent., payable Dec. 31.

Boston & Lowell, semi-annual, 4 per cent., payable Jan. 1.

Chicago & Eastern Illinois, quarterly, preferred, 1 1/2 per cent., payable Jan. 3.

Chicago & Northwestern, quarterly, preferred, 1 1/4 per cent.; semi-annual, common, 2 1/2 per cent., both payable Jan. 7.

Chicago Junction, & Union Stock Yards, semi-annual, common, 4 per cent.; quarterly, preferred, 1 1/2 per cent.; both payable Jan. 3.

Eastern (N. H.), 1 1/2 per cent., payable Dec. 15.

Kansas City Suburban Belt, 1 1/2 per cent., payable Jan. 1.

New York & Harlem, guaranteed, 4 per cent., payable Jan. 3.

North Eastern, of South Carolina, 3 per cent., payable Jan. 1.

Old Colony, quarterly, 1 1/4 per cent., payable Jan. 1.

Chicago City, quarterly, 3 per cent., payable Dec. 31.

West End Street, Boston, preferred, 4 per cent., payable Jan. 1.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The American Society of Civil Engineers meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The Association of Engineers of Virginia holds its formal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

The Boston Society of Civil Engineers meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The Canadian Society of Civil Engineers meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The Central Railway Club meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The Chicago Electrical Association meets at Room 1737 Monadnock Building, Chicago, on the first and third Fridays of each month, at 8 p. m. J. R. Cravath, Secretary.

The Civil Engineers' Club of Cleveland meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The Civil Engineers' Society of St. Paul, meets on the first Monday of each month, except June, July, August and September.

The Denver Society of Civil Engineers meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The Engineers' Club of Columbus, (O.), meets at 12 1/2 North High street, on the first and third Saturdays from September to June.

The Engineers' Club of Minneapolis meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The Engineers' Club of Philadelphia meets at the House of the Club, 1123 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Locomotive Foreman's Club* meets every second Tuesday in the clubroom of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *New York Railroad Club* meets at 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

The *St. Louis Railway Club* holds its regular meeting on the second Friday of each month, at 3 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is secretary.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

The Chicago Electrical Association.

A meeting of the Chicago Electrical Association was held Friday evening, Dec. 3, at Room 1737, Monadnock Block, Chicago. A paper was read by Mr. Cloyd Marshall, Electrical Editor *Street Railway Review*, entitled "Heavy Electric Traction."

Western Society of Engineers.

Mr. Isham Randolph, Chief Engineer of the Chicago Sanitary District, delivered a lecture entitled "The Drainage Canal," at Central Music Hall, Chicago, Tuesday evening, Nov. 30. The proceeds of the entertainment will be used by the Western Society Library Committee in purchasing books and binding papers for the library.

At a meeting Wednesday evening, Dec. 1, "Cement Testing" was discussed, Mr. T. T. Johnston leading the discussion.

St. Louis Railway Club.

At the meeting of this Club, held Nov. 12, the following subjects were announced for topical discussion at the next meeting, which will take place Dec. 10.

"Locomotives: What Type, Considering Present Conditions, Do You Consider the Most Economical for Passenger Service, and What Type for Freight Service?"

"The Compound Engine: What of It?"

"Has the Small Engine Seen Its Day?"

"Has the Modern Passenger Car, with its steam heat, gas or electric light, and elegant interior finish, reached the limit in the way of what shall be offered to the traveling public for simply a first-class fare?"

"The Freight Equipment: Compare the present cars—palace, stock cars, refrigerator cars, box cars of 60-ton capacity—with the equipment of earlier days. In those times people lived and did business with none of these conveniences. To what do you ascribe the change, and what of the future?"

"The Advancement Made in Track and Permanent Way."

"Uniform Code of Rules, the Child of the American Railway Association."

"Block Signaling."

"What Has Discipline Had to Do With the Advancement of the American Railway?"

"Will Electricity Supersede Steam on American Railways?"

The Committee of Arrangements for Future Meetings announces that the following gentlemen will present papers at the monthly meetings as indicated:

December meeting—Mr. Frank Rearden, Supt. Motive Power, Missouri Pacific.

January meeting—Col. S. W. Fordyce, President St. Louis Southwestern.

February—Professor Smart, Purdue University.

March—Mr. S. D. Webster, Gen. Claim Agent Terminal Railroad Association.

April—Mr. Chas. Wanghop, Chief Joint Car Inspector, East St. Louis.

RAILROAD LAW—RECENT DECISIONS.

It is decided in New York that a railroad company whose railroad terminates at a point or points at which the boats of two rival steamboat lines touch may enter into an agreement with one of the steamboat companies whereby each of the parties becomes the agent of the other for the transportation of passengers and freight and whereby the railroad company permits the steamboat company to enjoy the use of its terminal facilities, without thereby becoming obliged to enter into a similar arrangement with the rival steamboat company and to afford it the same facilities. The statute of the state which provides that "No stock corporation shall combine with any other corporation or person for the prevention of competition, or for the creation of a monopoly or for the unlawful restraint of trade, or for the prevention of competition in any necessary of life," does not apply to this case. Referring to the provisions of the statutes quoted the Court says: "The defendant is required to convey all passengers over its railroad to Clayton or Cape Vincent on precisely the same terms and under exactly the same conditions, regardless of what their place of destination may be after leaving the cars. If one is landed at its dock at such place all must be so landed; if one is landed at a more convenient place all must be landed at such place. So

all freight conveyed by the defendant to such places must be landed, dealt with and handled precisely the same, regardless of who the shipper may be, regardless of who the receiver may be and regardless of what its destination may be; and if, when those conditions are observed, the plaintiff is still at a disadvantage as compared with the Thousand Islands Steamboat Company or other steamboat company, relief is not to be found in the sections of the statutes referred to." The plaintiff has no right to demand that the railroad company shall appropriate its docks or other property to it for the purpose of conducting its private business and that without being paid anything. Neither does the statute apply which provides that "no preference for the transaction of the business of a common carrier upon its cars or in its depots or buildings or upon its grounds shall be granted by any railroad corporation to any one of two or more persons, associations or corporations competing in the same business" (decided in the Appellate Division, Sup. Ct., June, 1897).¹

Two cases decided in the same judicial department of the state of New York, hold, as a matter of law, that it is the duty of one approaching a railroad track which is temporarily obscured by smoke, to wait until the smoke is cleared away before he attempts to cross. If he does not so wait and is injured by collision with a train he cannot recover (decided in the App. Div. Sup. Ct., June, 1897).²

In the same state the plaintiff had boarded a street car and had told the conductor that he wished to stop over at a certain point, paid his fare and received a ticket from the conductor, which, the latter said, was good for a stop-over. When the plaintiff attempted to board the next car his ticket was refused, and upon his refusal to pay another fare he was ordered to leave the car, whereupon he did leave it. It is held, that proof of these facts is sufficient to support a verdict against the street car company for wrongful ejection from the car, as the act of the first conductor in giving a transfer ticket containing on its face no limitation as to its use was one so far within the scope of his apparent authority as to bind the railroad company to carry the passenger to the end of that route, notwithstanding the fact that the rules of the company, not communicated to the plaintiff, gave the first conductor no right to issue such a stop-over ticket. The fact that no actual force was used toward the passenger did not deprive him of his right to recover damages (decided in the App. Div. Sup. Ct., June, 1897).³

The United States Supreme Court has decided that a railroad employee who, after finishing his employment for the day and leaving the grounds of the company, is injured in the public highway by the negligent act of another employee, upon a moving train, the act being performed under authority from the company, express or implied, does not stand in the relation of a fellow servant to such employee within the meaning of the law limiting the liability of a master for injuries to one servant arising from the negligence of another. The duty of the railroad company to its employees is under the circumstances the same as that owed to anyone in the public highway near its tracks; "it is the use," in the language of the decision, "of reasonable diligence in the conduct and management of its trains, so that persons or property on the public highway shall not be injured by a negligent or dangerous act performed by anyone on the train, either a passenger or an employee acting outside and beyond the scope of his employment. The company does not insure against the performance of such an act, but it is under an obligation to use diligence to prevent its occurrence" (decided in the Sup. Ct., November, 1897).⁴

In New York, a street railroad company is not relieved from liability for the negligent failure of one of its servants to stop a car in time to avoid striking a man who has been thrown from a wagon drawn by a runaway horse and is lying unconscious on the track, by the fact that the runaway was the result of a collision which occurred, because of the injured man's negligence, between the wagon and another of the defendant's cars which had passed a few minutes before (decided in the App. Div. Sup. Ct. October, 1897).⁵ The rule that a plaintiff cannot recover damages for injury arising from negligence where he fails to show freedom from any negligence on his part contributing to the injury, does not apply here. Contributory negligence in order to avail as a defense must, generally speaking, be concurrent and simultaneous with the injury complained of.

In New York, it is negligence as a matter of law for a gripman to run his cable car at such a speed that he cannot avoid colliding with a vehicle plainly visible on the track 100 ft. away, or if he does not stop his car within that distance and avert the collision when the car is moving moderately (decided in the App. Div. Sup. Ct., October, 1897).⁶

It is held in Iowa that the foreman of a gang of bridge repairers who is charged with the duty of signaling approaching trains if the condition of the bridge requires it, is engaged in the operation of the railroad within the meaning of the statute which declares railroad companies liable for injuries to employees caused by the negligence of co-employees "engaged in the operation of any railway" and, accordingly, the railroad company is liable for the death of an employee who was killed by the derailment of a train while crossing the bridge owing to the foreman's neglect to signal the train (decided in the Sup. Ct., October, 1897).⁷

In the same state, where a railroad company fails and refuses to deliver to the consignee property shipped over its line, he is not bound to accept a tender thereof made more than three weeks after the time when the property should have been delivered, and after he has brought suit against the company. He may elect to claim damages for the value of the property and to waive all title to it, and after the company has been notified of such election the property belongs to it and is not subject to attachment in its hands as the property of the consignee (decided in the Sup. Ct., October, 1897).⁸

¹ The Alexandria B. S. Co. vs. N. Y. C., 18 App. Div. 527.

² Manley vs. N. Y. C., 18 App. Div. 429.

³ Yahue vs. N. Y. C., 18 App. Div. 452.

⁴ Ray vs. Cortland & H. T., 19 App. Div. 530.

⁵ Fletcher vs. B. & P., 18 Sup. Ct. Rep. 55.

⁶ McKee vs. Steinway Ry., 20 App. Div. 601.

⁷ Cass vs. Third Ave. Ry., 20 App. Div. 591.

⁸ Keatley vs. Ill. Cent., 72 N. W. 545.

⁹ Hamilton vs. C. M. & St. P., 72 N. W. 536.

PERSONAL.

—Mr. A. K. Glover, Auditor of the Natchitoches & Red River Valley, has resigned.

—Mr. P. S. O'Rourke, Superintendent of the Southern Division of the Grand Rapids & Indiana at Fort Wayne, Ind., has resigned.

—Mr. J. E. James, Northwestern Freight Agent of the Lake Shore & Michigan Southern, at St. Paul, Minn., has resigned.

—Mr. S. H. H. Clark, President and Receiver of the Union Pacific, says that he will not again be the President of the Union Pacific.

—Mr. L. F. Loree, General Manager of the Pennsylvania Lines West of Pittsburgh, sailed for Europe this week, where he will take a vacation of two months.

—Mr. Justice Spencer Atkinson, of the Supreme Court of Georgia, was appointed a Railroad Commissioner of that state Dec. 1, to succeed Judge Allen Fort, whose term expired some time ago.

—Mr. Joseph H. Rieman, at one time a Director of the Baltimore & Ohio and also of the Northern Central, now a part of the Pennsylvania, and a prominent financier of Baltimore, Md., died at his home in Baltimore, Dec. 3.

—At a recent meeting of the directors of the Chicago City Railway, at Chicago, Mr. M. K. Bowen and Mr. W. B. Walker were elected Directors, to fill vacancies caused by the resignations of Mr. J. C. King and Mr. E. W. Phelps.

—Mr. Samuel M. Gaines, assistant to Mr. O. L. Teachout, Superintendent of the Eleventh Division, Railway Mail Service, at Fort Worth, Tex., has been appointed Superintendent of that division, to succeed Mr. Teachout, resigned.

—Mr. John Laing Macaulay, at one time a Director of the New York & New England, now the New England, died in London, England, Dec. 3. He was known in Wall street, first as a commission merchant and afterward as a capitalist and speculator.

—Col. William Dudley Chipley, of Pensacola, Fla., at one time President of the Pensacola & Atlanta, now a division of the Louisville & Nashville, died Dec. 1 at Garfield Hospital, Washington, D. C. Colonel Chipley was a man of wealth and of philanthropy.

—Mr. John S. Kenyon, of Syracuse, has been appointed Secretary of the Board of Railroad Commissioners of New York, to succeed Mr. Charles R. De Freest. Mr. Kenyon has hitherto been Clerk of the State Senate and Secretary of the Republican State Committee.

—Mr. W. A. Stevenson has resigned as Trainmaster of the Pennsylvania & New York Division of the Lehigh Valley, with headquarters at Sayre, Pa., because of failing health. The resignation is to take effect Jan. 1. Mr. Stevenson and family will remove to Pasadena, Cal.

—Mr. J. L. Spoor, at one time General Manager of the Wagner Palace Car Company, has been elected President of the new corporation formed by the consolidation of the Union Stock Yards & Transit Co., the Chicago, Hammond & Western, and the State Line railroads.

—Col. A. M. Coffey, at one time Treasurer for six years of the East Tennessee & Virginia, now a part of the Southern, died at his home at Knob Noster, Mo., Nov. 29, at the age of 94. He served as Indian Agent in Kansas under President Fillmore, laid out the town of Paola, Kan., and gave it its name.

—Mr. Charles H. Sherman, who recently died at Dunkirk, N. Y., was the engineer who took the passenger train on which were Millard Fillmore, President of the United States, and his cabinet from the Hudson River to Lake Erie on the Erie Railroad. This was the first train that ever made the trip between tidewater and the lakes on any railroad, May 14, 1851.

—Mr. O. L. Teachout, Superintendent of the Government Railway Mail Service at Fort Worth, Texas, resigned, Nov. 25, to accept a newly created office, in which he will have charge of all matters relating to the carriage of mails of the Missouri Pacific, Iron Mountain, Texas & Pacific and the International & Great Western. His office will be at Washington, D. C.

—John Minton Kimball, General Agent for the Pennsylvania Company at Erie, Pa., died Dec. 2 at the age of 70 years. He was a native of Lowell, Mass., began railroading with the Boston & Lowell in 1852, was General Ticket Agent and later Superintendent on the La Crosse & Milwaukee, now the Chicago, Milwaukee & St. Paul; Assistant General Superintendent of the Michigan Southern and Northern Indiana; Assistant General Passenger Agent of the Pittsburgh, Fort Wayne & Chicago, at Chicago, and from May, 1870, to April, 1895, Superintendent of the Erie & Pittsburgh, now a part of the Pennsylvania company, and from 1895 up to his death General Agent of the same division at Erie, Pa.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—Henry B. Spencer has been appointed Assistant Superintendent, with office at Birmingham, Ala., effective Dec. 1.

Atlantic, Valdosta & Western.—The officers of this company, referred to in another column, are as follows: President, Walter Ferguson, Jr., New York City; Vice-President and General Manager, E. C. Long, Haylow, Ga.; Secretary and Treasurer, Edwin C. Weekes, New York City; Superintendent, D. M. Finlayson, Haylow.

Baltimore & Ohio.—J. B. Frost has been appointed Trainmaster of the Philadelphia Division at Philadelphia to succeed John Baun, promoted. (See this column for last week.)

Central of Georgia.—Bates F. Merritt, formerly in the freight office, has been appointed Soliciting Agent at Atlanta, Ga., to succeed C. C. Keene, resigned.

C. S. Adams has been appointed Commercial Agent at Montgomery, Ala.

Chesapeake & Ohio.—H. E. Parker has been appointed General Agent and Superintendent of Terminals at Newport News, Va.

Chesapeake, Ohio & Southwestern.—At the annual meeting of this road, a line controlled by the Illinois Central, held at Louisville, Ky., Nov. 27, Stuyvesant Fish, of New York, President of the road, was re-elected as President. Certain contemporaries incorrectly state that Hamilton Fish, of New York, was elected to this office.

Chicago & West Michigan.—F. A. Butterworth, formerly Manager of the Wisconsin & Michigan Car Service Association, has been appointed Commercial Agent of the Chicago & West Michigan, with headquarters at Milwaukee, Wis.

Chicago Great Western.—Paul V. Vermillion, Yardmaster at Kansas City, Mo., has been appointed General Yardmaster of the Des Moines-Kansas City Division, with headquarters at St. Joseph. C. W. Carter, Yardmaster at St. Joseph, has been transferred to Kansas City, Mo.

Cincinnati, Hamilton & Dayton.—Walter J. Nichols, heretofore Traveling Passenger Agent, with headquarters at Indianapolis, Ind., has been appointed Assistant General Passenger Agent at Cincinnati, O., to succeed George H. Smith, resigned.

Cleveland, Cincinnati, Chicago & St. Louis.—Charles H. Voges has been appointed general foreman of the shops of the Indianapolis and Sandusky divisions, at St. Louis, Mo., succeeding T. J. Timlin resigned.

Colorado & Northwestern.—The officers of this company, referred to in another column, are as follows: President, E. C. Thompson, Meadville, Pa.; Vice-President and Secretary, Chas. W. Mackay, 253 Broadway, New York City; General Manager, J. T. Blair, Boulder, Col.; Treasurer, Thos. R. Mann, Boulder; Chief Engineer, J. L. Frankeberger, Boulder.

Columbus, Sandusky & Hocking.—A. E. Luse, formerly Time Foreman of the Long Island, has been appointed Foreman of Engines at Columbus, O.

Detroit, Toledo & Milwaukee.—F. W. Robinson, Contracting Freight Agent of the Illinois Central at Milwaukee, Wis., has been appointed Commercial Agent of the Detroit, Toledo & Milwaukee and the Detroit & Lima Northern, with headquarters at Milwaukee, to take effect Dec. 15.

Duluth, South Shore & Atlantic.—J. J. Conolly, formerly Master Mechanic, has been appointed Superintendent of Motive Power and Machinery of this road and the Mineral Range and Hancock & Calumet, with headquarters at Marquette, Mich., to succeed J. C. Shields.

Flint & Pere Marquette.—A. J. Richter, heretofore Assistant General Passenger Agent of the Detroit, Toledo & Milwaukee, with headquarters at Milwaukee, and at one time connected with the Passenger Department of the Pennsylvania at the same city, has been made Advertising Agent of the Flint & Pere Marquette, at Detroit, Mich.

Georgia & Alabama.—The offices of the General Manager, General Freight and Passenger Agent, Auditor and Assistant Treasurer have been moved from Americus, Ga., to Savannah, where new offices have been opened.

Grand Rapids & Indiana.—J. W. Hunter, Master of Transportation at Fort Wayne, Ind., has been appointed Superintendent of the Southern Division, with headquarters at Fort Wayne, to succeed P. S. O'Rourke, made General Agent at Fort Wayne, Ind.

Grand Rapids, Kalkaska & Southeastern.—The officers of this company, referred to in another column, are as follows: President, Thos. Hefferam; Vice-President and Treasurer, Wm. A. Smith; Assistant Treasurer, C. B. Kelsey; Superintendent of Construction, John Doyle; Chief Engineer, C. A. Gordon.

Grand Trunk.—F. J. Watson, Division Freight Agent at Stratford, Ont., has been appointed Division Freight Agent at Montreal to succeed A. A. Harris, resigned.

Lake Shore & Michigan Southern.—M. E. Newell was appointed Dec. 1 Northwestern Freight Agent at St. Paul, Minn., to succeed John E. Jones, resigned.

Lehigh Valley.—The offices of George M. Harleman, Train Master of the Lehigh Division, now located at South Bethlehem, Pa.; Garrett Brodhead, Train Master of the New Jersey Division, now at Plainfield, N. J.; John Redington, Road Master of Lehigh Division, now at South Bethlehem; John Dinan, Road Master of the Pottsville Branch, now at Pottsville, and Edward J. Dorsey, Road Master of the New Jersey Division, now at Perth Amboy, N. J., are to be moved to Easton, Pa.

Mexican Central.—George J. Hartman, Superintendent of Chihuahua Division, at Ciudad Juarez, Mexico, has been appointed Assistant Superintendent. Mr. Hartman formerly was Superintendent of the Southern Division of the Atchison, Topeka & Santa Fe, at Wichita, Kan.

Mississippi River & Bonne Terre.—C. H. Sharman has been appointed General Manager to succeed J. Burns, resigned. Mr. Cavanaugh is appointed General Passenger and Freight Agent. Headquarters of both officers are at St. Louis, Mo.

Norfolk & Southern.—D. L. Risley, of Philadelphia, Pa., has been appointed Land and Immigration Agent.

Norfolk & Western.—J. M. Barr, Vice-President and General Manager, has assumed general control of the Traffic Department, formerly under William C. Bullett, resigned.

Ogdensburg & Lake Champlain.—Frank Owen has been appointed Traffic Manager to succeed H. A. Hodge, resigned. Edward P. Cutter has been elected Auditor to the Receiver to succeed F. A. Healey, resigned, with offices at Ogdensburg, N. Y. The position of Train Master has been abolished. Appointments and change took effect Dec. 1.

Omaha, Kansas City & Eastern.—Ira C. Hubbell has been appointed (Nov. 29) Purchasing Agent of this road and the Omaha & St. Louis, with office at Kansas City, Mo.

Penn Yan & Pennsylvania.—The officers of this recently organized road (see these columns for Oct. 8), have been elected as follows: George F. Andrews, of Owego, President; C. C. Covert, of Binghamton, Vice-President; Archibald K. Roberts, of Binghamton, Secretary; Chas. B. Brown, of Binghamton, Treasurer; and C. A. Cockcroft, of Binghamton, Chief Engineer.

Philadelphia & Reading.—A. R. Anthony, heretofore Train Master at Shamokin, Pa., has been appointed Assistant Superintendent of the Shamokin Division, with headquarters at Catawissa, Pa.

Pittsburgh, Bessemer & Lake Erie.—James K. Berth, of Gallion, O., has been made General Foreman of the shops at Greenville, Pa.

Plant System.—The announcement that C. L. Sprague, Traveling Passenger Agent of the Detroit & Cleveland Navigation Co., had succeeded J. B. Groff as Traveling Passenger Agent at Philadelphia is not correct.

Shreveport & Red River Valley.—A. K. Glover, heretofore Auditor of the Natchitoches & Red River Valley, has been appointed Auditor, with headquarters at Shreveport, La.

Southern.—Dr. J. M. Thomas, of Griffin, Ga., has been appointed Surgeon for the Macon Division.

Southern Indiana.—The names of the new officers of this reorganized road, formerly the Evansville & Richmond, whose change of name was noticed last week, are as follows: President, J. R. Walsh; Secretary and Treasurer, L. A. Walton; Auditor, F. B. Ogden, all of 185 Dearborn Street, Chicago; General Superintendent, J.

W. Thompson; Chief Engineer, George Crocker; General Freight and Passenger Agent, H. H. Roseman, Bedford, Ind.; General Eastern Agent, E. F. Giberson, No. 1 Madison Avenue, New York.

Southern Pacific.—Gen. Thomas H. Hubbard, of New York, Second Vice-President, has been elected, Dec. 2, First Vice-President to succeed the late C. F. Crocker. George Crocker, brother of the deceased, was elected to succeed General Hubbard.

H. M. Mayo, of the New Orleans Times-Democrat, has been appointed Advertising Manager of the Atlantic System, at New Orleans, La.

Texas & Pacific.—Charles J. Larimer, General Live Stock Agent, at Fort Worth, Tex., has been appointed Trainmaster of the Rio Grande Division, in addition to his other duties, Dec. 1. Charles M. Fowler has been appointed Soliciting Freight Agent at New Orleans, La.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Arkansas & Choctaw.—This company reports 30 miles of track completed, laid with 65-lb. rails and ballasted. The contract for 12 miles in addition was let Nov. 27, which will take the road to the Indian Territory line from which point the line will be extended in the spring northwest to Oklahoma Territory. The company has contracted for all the additional rails needed and has bought new locomotives and cars. W. H. Carson, Texarkana, Tex., is Superintendent. (See this column for Oct. 22.)

Astoria & Columbia River.—A letter from an official of this company states that the track has been laid over one-half the line from Astoria, Ore., along the south shore of the Columbia River, to Goble, a point on the Northern Pacific, 60.3 miles. All bridges are about completed, and it is expected that through connection will be made at Goble some time in January, the ballasting and filling in being finished in February, March and April. The road will probably be open for business in April or May. J. H. Curtis, of Astoria, Ore., is Chief Engineer. (See this column for Nov. 5.)

Atchison, Topeka & Santa Fe.—It is officially stated that surveyors are now at work for a proposed reduction of grades from Raton, N. M., south 111 miles to Las Vegas.

Atlantic, Valdosta & Western.—This road has acquired the Georgia & Florida, extending from Haylow, Ga., southeast 27 miles to the Suwannee River, and the St. Mary's Railroad from Fort Moniac, Fla., east to Crawford, 21 miles, and is now building the gap between the Suwannee River and Fort Moniac, 24 miles. The country through which the road extends is level. The principal business will be carrying lumber and naval stores. The officers are given in another column. This road is being built by G. S. Baxter & Co., of 18 Wall street, New York City. (See this column for Oct. 15.)

Centralia & Chester.—It is reported that this road, extending from Evansville, Ind., through Ellis Grove to Chester, 17 miles, has been completed. (See this column for Oct. 8.) C. M. Forman, Springfield, Ill., is Receiver.

Colorado & Northwestern.—About three-fourths of the grading from Boulder, Col., northeast 26 miles to Ward has been completed. One half of the bridges are up and four miles of track laid, all with new 56-lb. rails. There are to be nine steel bridges, each 53 ft. long. Orman & Crook, of Pueblo, Col., have the contract for all grading, tracklaying and bridges. The company is to have new engines and rolling stock of the latest and best patterns. Engineers are now locating an extension from Sunset southwest to Eldora, and another extension is being considered west across the summit over the mountain range. The names of officials are given in another column. (See this column for Nov. 5.)

El Paso & Northeastern.—It is reported that Wm. Cameron, of Waco, Tex., has been given the contract for laying 85 miles of ties on this road from El Paso, Tex., northeast, 165 miles to White Oaks, New Mex. (See this column for last week.)

Erie & Central New York.—It is officially stated that the entire 19 miles of grading from Cortland, N. Y., south east to Cincinnatus, N. Y., has been completed. Track has been laid for the 10 miles from Cortland to a point 1½ miles beyond Solon, and ballasting from Cortland to Solon, between which points there is regular train service. Bridges and trestles are nearly completed and 150 men and 40 teams are at work. The rolling stock for the road has been contracted for. W. D. Tisdale, of Cortland, N. Y., is President. (See this column for Oct. 29.)

Gila Valley, Globe & Northern.—A letter from an official of this road states that a contract has been let to the Midland Construction Co. for building this road from Geronimo, Ariz., northwest 60 miles to Globe. The right of way across the San Carlos Indian Reservation, however, has not been obtained as yet, and the work will probably not be resumed until after the close of this year. The company will use California redwood ties and 50-lb. rails. The rolling stock and motive power will be furnished from time to time as is required. The present line extends from Bowie, Ariz., a point on the Southern Pacific, northwest 68 miles to Geronimo. Wm. Garland, 313 Stimson Building, Los Angeles, Cal., is President. (See this column for July 9.)

Grand Rapids, Kalkaska & Southeastern.—It is reported that 17 miles of this road, from Van Buren, Mich., a point on the Chicago & West Michigan, southeast beyond Kalkaska, has been graded and eight miles of track laid. Six hundred men are at work, and it is expected to complete 32 miles of road into Missaukee Co.

by Jan. 1. The road as projected is to extend from Van Buren by way of Kalkaska east to Grayling. The officers are given in another column.

Illinois Central.—It is stated that the double track from Carbondale, Ill., south to Cairo, 57 miles, is about completed, and will be thrown open for use within the week. The new track has been stone ballasted, and the bridges and culverts rebuilt in concrete.

Kansas City, Osceola & Southern.—It is reported that surveys have been completed for the proposed extension from Osceola, Mo., southeast 40 miles to Bolivar, to connect with the St. Louis & San Francisco. This is the extension for which arrangements have been made by the St. Louis & San Francisco. (See this column for Nov. 12.)

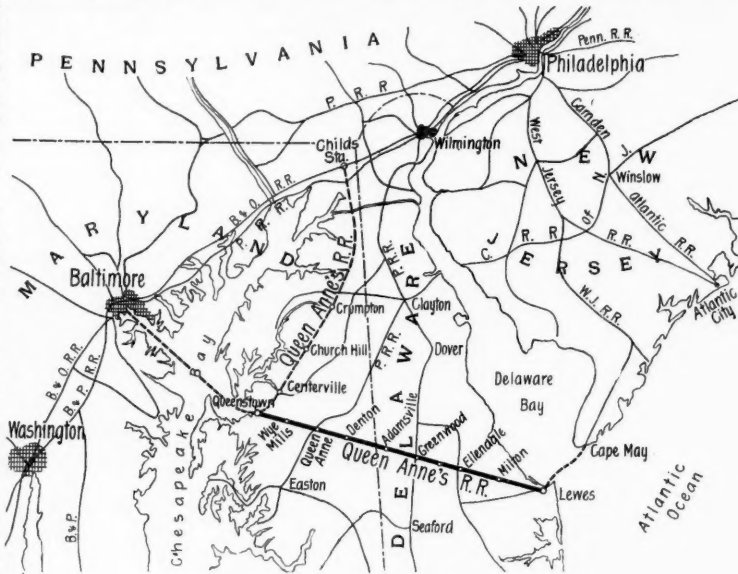
Kansas, Colorado Central & Southwestern.—It is reported that contracts have been let for 30 miles for this line from Caney, Kan., south to Bartlesville, I. T., and that work will begin at once. The entire line is projected to extend to Stillwater, Oklahoma Territory. J. H. Bartles, of Bartlesville, I. T., is President. (See this column for Jan. 29.)

Little River Valley Railway.—This company was incorporated in Arkansas, Dec. 3, with capital stock of \$500,000, to build a line from Neal Springs, a point on the Texarkana & Fort Smith, west 40 miles through Nashville, a point on the Arkansas & Louisiana, to the Arkansas state line near Cerro Gorda. The officers and incorporators are as follows: D. C. Richardson, of Oklahoma, President; Judge L. A. Byrne, of Texarkana, Tex., Vice-President; T. M. Butts, Secretary; I. N. Lund, Treasurer, and S. H. Nunnally, of Sevier County.

Manistique & Northwestern.—It is officially stated that no more grading or other contracts will be let at present for this line, which has been completed from Manistique, Mich., northwest 36 miles to Steuben. The present train service of three trains each way per day has been in effect since Aug. 23.

Matamoras & New York.—This company was incorporated in New York Dec. 7, with a capital stock of \$50,000, to build a line three-fourths of a mile long, from Matamoras, Pa., across the Delaware River to Port Jervis, N. Y. The directors are: A. E. Leithbridge, of Brooklyn; E. Monthmont, of Milford; L. H. Smith, P. Q. Deyo, J. G. Hillyard, E. C. Harbordt, F. F. Sargent, J. H. Thompson, Jr., and Charles M. Clark, of New York City.

Queen Anne's.—It is stated that this road has been completed to within 1½ miles west of La wes, and it is expected that the entire road will be completed before the end of the year. This road extends from Queenstown, Md., on the Chesapeake Bay, southeast in almost a straight line



Line of the Queen Anne's Railroad.

through Queen Anne's, Denton, Md.; Adamsville, Del.; Greenwood, Ellendale and Milton to Lewes, Del., a point on the Delaware Bay, in all 60 miles. The company already operates steamers from Queenstown west to Baltimore and proposes to operate another line from Lewes across Delaware Bay to Cape May. Trackage rights have just been acquired from the Pennsylvania from Lewes south to Rehoboth Beach. The company is planning an extension of about 54 miles from Queenstown north via Centerville and Crumpton to Child's Station, Md., opposite Elkton, on the Baltimore & Ohio. About half of the right of way has been secured and construction will begin in the spring. I. W. Troxel, Queenstown, is General Manager. (See this column for Sept. 3.)

Mexican Central.—This company sends official announcement that it has completed arrangements for building the extension from Jimenez, Mex., southwest 56 miles to Parral (noted in this column Nov. 12). The right of way has been obtained and the contract for grading let to Hampson & Smith, extensive contractors in the Republic of Mexico. The company expects to have the line completed and in operation by June 1, 1898. This branch will afford transportation facilities for the extensive silver mines at Parral and beyond.

Milwaukee, Benton Harbor & Columbus.—It is officially stated that the 27 miles of track from Benton Harbor, Mich., south to Buchanan has been completed and two trains are running each way per day. All bridge work has been completed, including the 233 ft. of steel bridge across St. Joseph river, and the 2,700 ft. of new trestle, the greater portion of which is double-decked. A large portion of the work including grading and track laying has been done by the Crouch Construction Co. A. A. Patterson, Jr., of Benton Harbor, Mich., is General Manager. (See this column for Aug. 13.)

Mississippi River & Bonne Terre.—Plans are under consideration for an extension of this line from Doe Run, Mo., south to Memphis, Tenn., 162 miles, and from Riverside north 27 miles to St. Louis, Mo. The road now runs from Riverside to Doe Run, 47.5 miles. C. H. Sharman, of St. Louis, Mo., is General Manager.

Mobile, Jackson & Kansas City.—It is officially stated that grading on this line is nearly all completed from Mobile to Hattiesburg, Miss., 50 miles, and that nearly 40 miles of track has been laid from Frascati to the Pascagoula River. Regular train service is in operation between Frascati and McCreary's, Miss., 30 miles, all the trestles, grading, etc., having been completed. The steel bridge over Dog river is being erected and 400 men and teams are at work grading on the section beyond, under C. D. Smith & Co., of Alabama, contractors. Contracts for grading, clearing, etc., for further extension will be let shortly. (See this column for Oct. 29.)

North Bend & Kettle Creek.—During the year this company has built three miles of temporary feeders for hauling timber, which will be removed as soon as the timber has been taken out. In addition 1½ miles of main track has been built to Lebo Run, Pa. The company has under construction 2½ miles from Lebo Run to Black Forest, and proposes to build six miles beyond that point, to Oleona, Potter Co. This section of the road has a maximum grade of about 2 per cent. Surveys have been completed to Summit, 3 miles from Oleona Junction, and the road will be completed during the coming year. The work is being done by the company under the direction of Chas. Greco, of Gleason, Superintendent of Construction. About 70 men are now at work, and these will continue until winter weather becomes too severe. The maximum grade on the southern side of Summit is 40 ft., the maximum curve is 18 deg. The Lebo Run branch has some grades of 200 ft. per mile and curves of 28 deg. This section has five trestles ranging in length from 190 to 330 ft. There are no bridges of consequence, except a wooden structure across Young Woman's Creek, 64 ft. long.

Pittsburgh, Bessemer & Lake Erie.—It is officially stated that grading and tracklaying have been completed on the entire 42 miles between Butler and Resemer, Pa., and that ballasting has been begun. The 2,900-ft. tunnel will be done about Feb. 1. (See this column for Oct. 29.)

Richmond, Petersburg & Carolina.—It is stated that engineers are making a new location for this line from the belt line at Petersburg, Va., to a point in Dinwiddie Co., which will materially alter the road first determined upon. It is stated that two million dollars will be required to build the road, all funds to be furnished by New York capitalists. The road as projected is to run from Ridgway, N. C., north to Richmond, Va., 106 miles, and is to be completed by Aug. 1, 1898. (See this column for Nov. 19.) Gen. Jas. F. Negley, 136 Liberty street, New York, is Vice-President and General Manager.

San Francisco & San Joaquin Valley.—It is officially stated that trains are now running daily between Stockton and Hanford and Fresno and Visalia, Cal. Grading has been completed to the Kern County line, and is being carried on south toward Bakersfield. One hundred teams are now at work. The contract for this section of 40 miles is let to Grant Bros., of San Francisco, who will be required to move about 500,000 cu. yds. of dirt. Surveys are in progress on the line from Stockton west to San Francisco, on which line there will be a tunnel 5,700 ft. long. (See this column for Nov. 5.) W. B. Storey, Jr., 321 Market street, San Francisco, is Chief Engineer.

Short Line.—The differences which have arisen among this company, the city of Clarksburg, W. Va., the Baltimore & Ohio R. R. and the Wrought Iron Bridge Co., of Clarksburg, have been adjusted in a manner satisfactory to all concerned, and work is being continued on the railroad through the city. The company is at work on the portion of the line to New Martinsville, and is making locating surveys for the rest of the route. (See this column for last week.)

Shreveport & Red River Valley.—It is reported that Wymbish & Co., and Hunter Bros. & Co., of Shreveport, La., have obtained the contract for completing this road, which is projected to extend from Shreveport south along the Red River Valley to Coushatta, La., 64 miles. G. W. Fouke, of Texarkana, Tex., is Vice-President. (See this column for Nov. 5.)

Southern.—Official confirmation is given to the statement made in this column Nov. 12, that work has been begun on the extension of the North Carolina Midland line of this road, from Mocksville, N. C., northeast 28 miles to Mooresville, on the Charlotte & Taylorsville Division. The contract is let to T. B. Jones & Co., of Baltimore, Md. W. H. Wells, Chief Engineer of the North Carolina Midland at Cleveland, N. C., is in charge of the work.

Sparks, Moultrie & Gulf.—This road from Sparks, Berrien County, Ga., west 24 miles to Moultrie has been completed. It connects at Sparks with the Georgia Southern & Florida, and at Moultrie with the Georgia Northern. (See this column for March 26.)

Wiscasset & Quebec.—It is officially stated that 50 miles have been completed of this line from Wiscasset, Me., north through Albion to Burnham. About 100 men are at work on the remaining portion of 12 miles, which has several grades of 2 per cent and curves of 12 deg. There will be three iron bridges. Bonds to the amount of \$600,000 have been issued covering the entire 62 miles of road. W. F. P. Fogg, of Wiscasset, Me., is General Manager. (See this column for Nov. 12.)

Electric Railroad Construction.

Baltimore, Md.—The Garrison Avenue Railroad Co. has been organized with a capital stock of \$100,000, to build an electric road on Garrison avenue. The incorporators include William A. House and Nelson Perin.

Camden, N. J.—The Camden & Suburban Railway Co. has been granted permission to lay tracks on the River road.

Dayton, O.—The Dayton, Spring Valley & Wilmington Transit Co., with offices at Dayton, O., has been incorporated with a capital stock of \$50,000, to build an electric road between Dayton and Wilmington, through the counties of Montgomery and Clinton. It is proposed to carry freight and mail besides offering good passenger service. The incorporators are J. M. Wilson, Wallace Berryhill, J. H. Racer and others.

Monroe, Mich.—The franchise granted last season to Jacobson and Johnson for an electric road in Monroe, Mich., has been repealed and a new franchise granted to Alex. Riopelle, of Detroit.

Mt. Washington, Mass.—H. F. Kieth has filed with the Secretary of the Commonwealth for Massachusetts a petition for the incorporation of a street railroad from Monterey, through Great Barrington and Egremont across the state line into New York. It is stated that he will ask the right to carry freight, which cannot be done under general laws.

New Orleans, La.—The New Orleans & Carrollton Railroad Co. will build a short extension of its line, the employees of the company performing the work.

New York.—The Fulton, Wall Street & Cortlandt Street Ferries Railroad Co. has filed an application to lay tracks and operate cars on many of the streets in the lower part of the city. This company was organized some years ago, but no construction work has been done by them.

The Board of Aldermen on Dec. 2 took further action on the matter of granting the right of the Pelham Park Railroad Co. to build an electric road from Pelham Park. The matter had been considered by the Aldermen, and had been placed in the hands of the Mayor for approval. The object of the reconsideration was to limit the franchise to 25 years.

Obion, Tenn.—The Obion & Tiptonville Rapid Transit Co. has made an application for a charter to build an electric road from Obion to Tiptonville, through Ham-burgh and Lane's Ferry. Among those interested are G. B. Morris and W. M. Wilson.

Palmer, Mass.—The Palmer & Monson Street Railway Co. awarded the contract for building its line, which is to connect with several towns, to F. T. Ley & Co., Springfield, Mass.

Philadelphia, Pa.—The Committee on Street Passenger Railways of the City Council has agreed to report favorably on an ordinance extending the time for building the Delaware & Schuylkill Passenger Railway Co. of June 27, 1899. The original ordinance was approved June 27, 1893, and the time for its building has been twice extended.

Pine Bluff, Ark.—The Pine Bluff Power and Transit Co. has been organized by some of the citizens of Pine Bluff, but nothing has been done toward the construction of the road, and Mr. D. C. Bell, the Manager, informs us that nothing will be done further until money has been secured for its construction. The city offers \$10,000 cash bonus and 10 years' public lighting to a builder of such an enterprise.

Pottsville, Pa.—Many improvements are being made by the Schuylkill Electric Railway Co., in making repairs and improvements to its roadbed in many parts of the city.

Salisbury, N. C.—The Salisbury Street Railway & Electric Co. has been organized and an effort is being made to obtain a franchise to build an electric line in the city and vicinity. Among those interested is D. L. Risley, Philadelphia.

Scranton, Pa.—Mr. Frank Silliman, Jr., General Manager of the Scranton Ry. Co., informs us that the work of extending the company's line for about one-half mile was begun last month.

Syracuse, N. Y.—The Syracuse Construction Co. has been formed to proceed with the building of the line of the Onondaga Lake Railroad Co. Mr. Henry S. Newton has been appointed to superintend the work, and it is expected that the line will be in operation by next summer.

Titusville, Pa.—The Titusville Traction Co., is making rapid progress with construction work in Titusville.

Tower City, Pa.—The Luykens & Williams Valley Electric Passenger Railway Co. has been granted a right of way through the borough of Williamstown and it is expected that permission will also be granted by the other boroughs through which the road will pass.

Warren, Pa.—The Warren Street Railway Co. has secured permission to build on certain streets, the measure having passed over the veto of the Mayor.

GENERAL RAILROAD NEWS.

Alaska.—A bill was introduced into the U. S. Senate Dec. 7 authorizing the Dyea-Klondike Transportation Co. to build a line of transportation from Dyea to Lake Bennett, the line to consist of railroad, aerial tramways or wagon roads, as the company may deem proper. Another bill was introduced into the Senate granting similar right of way to the Skaguay & Lake Bennett Tramway Co. from Skaguay over the White Pass to the boundary line of the Northwest Territory on the Skaguay trail.

Altoona & Beach Creek.—It is stated that the stockholders of this road, which extends from Juniata to Dougherty, Pa., 13 miles, have decided to place the property in the hands of the Directors, either for lease or sale. This road is the successor of the Altoona, Clearfield & Northern, which was sold on Feb. 6 last. (See this column for April 30.)

Atchison, Topeka & Santa Fe.—A syndicate has been formed composed of Messrs. Kuhn, Loeb & Co., Speyer & Co. and the Guaranty Trust Co. to acquire the outstanding guaranty fund of six per cent. notes, amounting to \$8,605,000, which mature Nov. 1, 1898. This action will clear the road of all prior liens, making the general mortgage bonds first mortgage on the main line and secured practically by all the stocks and bonds of the other lines of the road.

Baltimore & Ohio Southwestern.—Holders of Ohio & Mississippi Railway Co. Equipment Trust Bonds are notified that in compliance with the terms of the Trust, \$20,000 of these certificates have been withdrawn for redemption, and that interest will cease on Jan. 1.

Central Pacific.—In his annual report to Congress Attorney General McKenna makes the following statement with reference to the Central Pacific, the foreclosure of whose mortgages to the government must shortly be entered:

"The general features of the relations between the government and the Central Pacific Railroad Company, which includes what was the Western Pacific Railroad Company, are the same as those between the government and the Union Pacific, notwithstanding that the Central Pacific was originally a California corporation. Its indebtedness to the government on the 1st inst. was as follows, cents omitted:

Bonds loaned:	
Central Pacific.....	\$25,875,120
Western Pacific.....	1,970,569
Interest paid by United States:	
Central Pacific.....	\$44,640,270
Western Pacific.....	3,313,919
Accrued interest, four months, unpaid:	
Central Pacific.....	\$396,222
Western Pacific.....	33,011
Interest repaid:	
By transportation, Central Pacific.....	\$8,657,699
By cash, Central Pacific.....	638,283
By transportation, Western Pacific.....	9,367
Balance by interest not repaid:	
Central Pacific.....	\$35,924,237
Western Pacific.....	3,304,552

Total indebtedness:

Central Pacific.....	\$61,909,357
Western Pacific.....	5,275,115
Gross total payable by Central Pacific.....	67,184,472
Sinking fund Central Pacific bonds.....	437,000
Sinking fund Central Pacific cash.....	7,003,569
Total sinking fund.....	7,440,569

"Crediting the company with all possible items disputed, as well as admitted to be due to it, there will be due on Jan. 1 next \$46,752,087.

"What steps may be taken to meet this indebtedness in the meantime remains to be seen, and the action of the department will depend upon the circumstances existing at that date, no action having thus far been taken in order to avoid any question arising out of the claim of the company that by reason of the credits to which it is entitled it has not yet been in default."

Central Washington.—The sale of this road, which was ordered to take place Nov. 30, has been postponed on motion of Judge Thos. Burke, to be held Jan. 20. This road, which extends from Cheney, Wash., to Coulee, 108.3 miles, was leased upon its completion in 1891 to the Northern Pacific, but went into the hands of Receivers in 1893, and the lease was cancelled two years later, since which time the road had been operated by the Receiver. The suit for foreclosure of mortgage, under which the road is to be sold, was brought by the Farmers Loan and Trust Co. to secure payment of \$2,156,000 50-year six-per cent. bonds, and this was transferred to the Knickerbocker Trust Co., of New York, as Trustee for the bondholders on April 19, 1895. (See this column for May 14.)

Chicago & Northwestern.—Gold bonds at 3½ per cent. to the amount of \$20,000,000 are being offered by Kuhn, Loeb & Co., New York City, which bonds are a portion of the \$165,000,000 of general mortgage bonds demised upon under the new plan of refunding. Of this offer \$2,000,000 are for cash, and the remaining \$18,000,000 may be exchanged for old bonds as follows: Chicago & Milwaukee 7 per cent. bonds due July 1, 1898, at 104½ per cent.; the Iowa Midland 8 per cent. bonds due Oct. 1, 1900, at 113 per cent.; Escanaba & Lake Superior 6 per cent. bonds due July 1, 1901, at 110½ per cent.; Chicago & N. W., Iowa Div., 4½ per cent. bonds due April 1, 1902, at 104½ per cent.; Chicago & N. W. General Consolidated mortgage gold 7 per cent. bonds due Dec. 1, 1902, at 119 per cent. The new bonds will bear interest from Nov. 1.

Chicago, Burlington & Quincy.—The earnings for October and the four months ended October 31 were as follows:

	1897.	1896.	Inc.
October:			
Gross earn.....	\$4,357,251	\$3,773,809	\$583,442
Oper. expen.....	2,345,618	1,885,317	440,331
Net earn.....	\$2,031,633	\$1,888,492	\$143,111
Four months:			
Gross earn.....	\$15,668,566	\$12,805,976	\$2,862,590
Oper. expen.....	8,838,269	7,253,846	1,585,363
Net earn.....	\$6,829,357	\$5,552,130	\$1,277,227

Cleveland, Cincinnati, Chicago & St. Louis.—The earnings for October and for the four months ended Oct. 31 were reported as follows:

	1897.	1896.	Inc.
October:			
Gross earn.....	\$1,297,581	\$1,152,791	\$144,819
Oper. expen.....	1,022,413	896,412	125,991
Net earn.....	\$275,178	\$256,350	\$18,828
Charges.....	237,517	230,550	6,967
Surplus.....	\$37,661	\$25,800	\$11,861
Four months:			
Gross earn.....	\$1,886,343	\$1,465,132	\$421,211
Oper. expen.....	3,769,961	3,379,165	390,796
Net earn.....	\$1,116,382	\$1,085,967	\$30,415
Charges.....	932,076	914,061	18,015
Surplus.....	\$184,306	\$151,906	\$32,400

Cumberland & Pennsylvania.—Holders of first mortgage bonds dated April 1, 1891, are notified that the company will purchase 24 of these bonds at 106, with accrued interest, at the office of the Consolidated Coal Co., 44 South St., Baltimore, Md.

Denver & Rio Grande.—The earnings for October and the four months ended October 31 were as follows:

	1897.	1896.	Inc. or Dec.
October:			
Gross earn.....	\$791,957	\$722,225	\$69,732
Oper. expen.....	476,094	404,080	72,014
Net earn.....	\$315,953	\$318,165	D. \$2,212
Fixed charges.....	303,318	200,037	I. \$1,281
Surplus.....	\$110,635	\$118,128	D. \$7,493
Four months:			
Gross earn.....	\$2,906,383	\$2,592,144	I. \$314,239
Oper. expen.....	1,706,640	1,519,956	I. 186,684
Net earn.....	\$1,199,743	\$1,072,188	I. \$127,555
Fixed charges.....	795,129	781,985	I. 13,144
Surplus.....	\$404,614	\$290,203	I. \$114,411

East Stroudsburg & Matamoras.—This road was sold at Sheriff's sale in November to C. B. Staples, attorney for the bondholders, for \$50. The sale was made to satisfy executions by Staples & Erdman, amounting to \$850. This company was chartered in Pennsylvania, Oct. 23, 1894, with a capital stock of \$400,000, to build a line through Monroe and Pike counties, from East Stroudsburg northeast 40 miles to Matamoras. The President of the first Board of Directors was Simon Friedberger, of 731 Reading Terminal, Philadelphia. It is stated that the new road has passed into the hands of the Delaware Valley, Hudson & Lehigh, which proposes to build it along the present line of survey.

Great Northern.—The gross earnings for November and for the five months ended Nov. 30 were as follows:

	1897.	1896.	Inc.
November:			
St. P., M. & M., Leased Lines.....	\$1,815,886	\$1,618,388	\$207,498
Eastern Ry. of Minn.....	280,985	213,977	77,148
Montana Central Ry.....	195,667	153,974	41,593
Total for system.....	\$2,342,438	\$2,016,390	\$326,139
Five months:			
St. P., M. & M., Leased Lines.....	\$9,033,795	\$8,228,984	\$804,811
Eastern Ry. of Minn.....	1,117,182	1,040,543	106,639
Montana Central Ry.....	925,939	810,198	115,741
Total for system.....	\$11,106,966	\$10,079,725	\$1,027,181

Kansas Pacific.—In his annual message to Congress, President McKinley calls attention to the fact that if the road is not sold for more than the upset price fixed by the Court, the sale will not yield to the government more than \$2,500,000 on its claim of nearly \$13,000,000. He announces that he will direct the Secretary of the Treasury to make the necessary deposit of \$900,000 to qualify the government for making a bid at the sale, this bid to be at least equal to the principal of the debt, and calls upon Congress to take action as to whether actual bidding should take place at the time of the sale on Dec. 15 and 16.

Louisville & Nashville.—The earnings for October and for the four months ended Oct. 31, were reported as follows:

	1897.	1896.	Inc. or dec.
October:			
Gross earn.	\$1,868,454	\$1,562,049	D. \$306,405
Oper. expen.	1,250,193	1,215,957	I. 34,236
Net earn.	\$618,261	\$346,092	D. \$272,169
Four months:			
Gross earn.	\$7,366,887	\$6,996,134	I. \$370,753
Oper. expen.	4,810,785	4,747,925	I. 62,860
Net earn.	\$2,496,102	\$2,248,209	I. \$247,893

Mexican Central.—The earnings for October and for the ten months ended Oct. 31 were reported as follows:

	1897.	1896.	Inc.
October:			
Gross earn.	\$1,085,182	\$908,326	\$176,856
Oper. expen.	746,455	628,613	117,842
Net earn.	\$338,727	\$279,713	\$59,014
Ten months:			
Gross earn.	\$10,491,974	\$8,304,472	\$2,187,502
Oper. expen.	7,349,458	5,393,821	1,955,637
Net earn.	\$3,142,516	\$2,910,651	\$231,865

Mexican International.—Subscriptions have been opened by Speyer Bros., of London, for £1,200,000 prior lien 4½ per cent. bonds which are offered at 88½ and accrued interest. These bonds are issued together with \$4,635,000 four per cent. Consols and \$4,449,000 income bonds to take the place of \$15,134,000 first mortgage four per cent., which have been retired. By this arrangement the fixed charges have cost from \$605,360 to about \$448,000. (See this column for July 30.)

Morristown & Cumberland Gap.—This road will be offered for sale at auction by Special Master H. M. Sherwood, at Morristown, Tenn., on Dec. 27, with a separate sale of the rolling stock. The purchaser in payment may give his notes to be secured by liens on the property, these notes to run 6, 12 and 18 months. The sum of \$10,000 must be paid in cash at the time of the sale. The upset price is \$85,000.

New York Central & Hudson River.—The gross earnings for Nov., 1897, were \$3,960,753, against \$3,882,318 for the corresponding period of 1896, making a net increase of \$78,435.

Norfolk & Western.—The earnings for October and for the four months ended Oct. 31 were as follows:

	1897.	1896.	Inc. or dec.
October:			
Gross earn.	\$955,893	\$902,215	I. \$53,678
Oper. expen.	667,208	637,672	D. 29,536
Net earnings.	\$288,685	\$264,543	I. \$24,142
Four months:			
Gross earn.	\$3,883,176	\$3,529,563	I. \$353,613
Oper. expen.	2,622,686	2,322,328	I. 300,358
Net earn.	\$1,260,490	\$1,207,235	I. \$53,255

Omaha, Kansas City & Eastern.—The Kansas City, Pittsburgh & Gulf has assumed the management of this road, which, with its recent additions, extends from Omaha southeast 315 miles to Quincy, Ill. With the completion of the Kansas City & Northern Connecting from Kansas City to Pattonsburg, the Kansas City, Pittsburgh & Gulf will have a connected road from Omaha and Quincy to the Gulf. (For a more full description of these roads and their connections see these columns for Nov. 5.)

Oregon Improvement Co.—Depositors of the various securities called for by the Reorganization Committee, of which John I. Waterbury is Chairman, are notified that the fourth installment of \$25 on each consolidated bond, \$2.50 on each share of preferred stock and \$2 on each share of common stock, according to the agreement detailed in this column Sept. 12, has been called, to be paid at the office of the Manhattan Trust Co., of New York, or the Old Colony Trust Co., of Boston.

Oregon Railroad & Navigation Company.—The earnings for October and the four months ended October 31 were reported as follows:

	1897.	1896.	Inc.
October:			
Gross earn.	\$725,565	\$695,949	\$29,616
Oper. expen.	322,008	272,505	49,503
Net earn.	\$403,557	\$393,444	\$10,113
Four months:			
Gross earn.	\$2,424,479	\$2,338,556	\$85,923
Oper. expen.	1,176,877	982,698	194,179
Net earn.	\$1,247,602	\$855,858	\$391,744

Philadelphia & Reading.—Holders of 10-year sinking fund five per cent. gold loan of 1902 are notified that the company will purchase 30 of these bonds at the lowest rate offered, not exceeding par with accrued interest, at any time up to 12 o'clock noon of Dec. 31, at the office of the Trustee, Philadelphia.

Saratoga & St. Lawrence.—This road was sold at auction at Malone, N. Y., Dec. 4, to Ernest C. Reynolds, of Bombay, N. Y., on behalf of the bondholders, for the sum of \$500. This road, as stated last week, has been leased since June 1, 1889, to the Ogdensburg & Lake Champlain, but it was taken back into the hands of the stockholders Nov. 17. The road extends from Moira, N. Y., north 8.5 miles to Bombay.

A new company has been organized to take this road, known as the Bombay & Moira, with a capital stock of \$100,000. The following Board of Directors have been chosen: Samuel W. Foster, Montreal; H. C. Smith, St. Albans; Charles Parsons, New York; Louis Hasbrouck, Ogdensburg; T. A. Sears, Bombay; William T. O'Neil, St. Regis Falls; Charles E. Brush, Moira; John A. Richey, Tupper Lake; Thomas Cantwell, F. D. Kilburn, D. W. Lawrence, N. M. Marshall, Frederick P. Wilson and W. J. Meers, Malone.

Sonora.—Chairman Walker, of the Atchison, Topeka & Santa Fe, authorizes the statement that the exchange of the Sonora line, controlled by the Southern Pacific for Mojave Division of the Atchison, Topeka & Santa Fe, will be carried out by exchanging long-time leases, the Mojave Division being subject to the Southern Pacific mortgages not yet secured.

Southern Pacific.—The earnings for October and for the four months ended Oct. 31 were reported as follows:

	1897.	1896.	Inc. or Dec.
October:			
Gross earn.	\$4,431,260	\$5,179,912	D. \$748,652
Oper. expen.	2,568,681	2,857,942	D. 289,260
Net earn.	\$1,862,579	\$2,321,970	D. \$459,391
Four months:			
Gross earn.	\$18,791,728	\$17,624,210	I. \$1,167,518
Oper. expen.	10,775,311	10,534,123	I. 241,188
Net earn.	\$7,996,417	\$7,090,087	I. \$896,330

Summit Branch.—The Summit Branch Coal Co. has been incorporated in Pennsylvania to succeed the Sum-

mit Branch, which was sold at auction at Philadelphia July 13, for \$50,000. (See this column for July 16.) The directors and officers of the new company are as follows: E. B. Morris, William D. Winsor, Captain J. P. Green, Samuel Rea, Isaac J. Wistar and Joseph U. Crawford. George H. Ross was elected Secretary and A. Haviland Treasurer.

Electric Railroad News.

Brooklyn.—The Brooklyn City & Newtown Railroad has been leased to the Coney Island & Brooklyn road. The two have been operated for some time under practically one management.

At a meeting of the Sea Beach Railroad directors Mr. C. L. Rossiter was elected President, and Mr. T. S. Williams, Secretary of the company, thus making the road under the same administrative officers as the Brooklyn Heights Railroad.

The gross earnings of the lines of the Brooklyn Rapid Transit Co. for November are as follows:

	1897.	1896.
November:		
Passenger earnings.	\$417,962	\$403,165
Other earnings from operation.	15,742	18,295
Gross earnings.	\$433,704	\$421,460

Buffalo, N. Y.—The Buffalo Traction Co. has filed with the city a bond of \$200,000 to take the place of individual bonds. It covers the company's liability under the franchise obtained from the city.

Maundsville, W. Va.—The Benwood & Southern Railway Co. has been taken out of the hands of Receiver Howard Hazlett, who has managed it for two years under the U. S. District Court, and has been placed in the hands of the old company reorganized. Our correspondent informs us that the company will buy a complete new outfit of winter cars. The road runs from Maundsville to Benwood, W. Va., where it connects with the Wheeling Electric Railway, a total length of about eight miles. Mr. Alfred Paul is general manager.

TRAFFIC.

Traffic Notes.

The Seaboard Air Line announces that "in order to meet the action of its competitors" it will carry 300 lbs. of baggage free for each passenger.

The Canadian Pacific has made a reduction of 8 cents per 100 lbs. from 28 to 20, in the rate on grain to Montreal from points west of Fort William.

The railroads of Michigan held a conference this week to consider a proposition to adopt an interchangeable mileage ticket for use within the state of Michigan.

The freight movement through the Sault Ste. Marie canals, both sides, in November amounted to 1,330,473 tons eastward and 825,597 tons westward; total, 2,156,070 tons.

The Kansas City Stock Yards Co. has reduced the prices for feeding cattle at the yards; corn is to be furnished at 60 cents a bushel instead of \$1, and hay at 80 cents per 100 lbs. instead of \$1.

The Brooklyn Annex Ferry Co., running ferryboats between Brooklyn, N. Y., and the Jersey City station of the Pennsylvania Railroad, is now wholly under the control of the Pennsylvania Railroad Co.

The freight movement over the Middle Division of the Pennsylvania in November was 132,845 cars, of which 76,718 were loaded. The movement in November, 1896, was 113,320 cars, of which 64,780 were loaded.

On Dec. 15 a sleeping car line will be established between St. Louis, Mo., and Charleston, S. C., over the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Georgia and the South Carolina & Georgia roads.

The resolution recently adopted by the railroads in Kansas, to curtail or abolish passenger privileges on freight trains, has caused a large amount of discussion. A manufacturer in Detroit, Mich., says that if his traveling salesman in Kansas cannot ride on freights they will have to be withdrawn from that territory, as the cost of traveling will be increased about 25 per cent.

The order of the Nebraska Board of Transportation requiring the restoration of carload rates on live stock is tentative in its character, and further investigation appears to be intended. It says explicitly that the members of the Board favor rates by the hundred pounds. From investigations thus far made it appears that the changes made by the railroads would make larger increases on long distance shipments than on those for short distances.

The State Railroad Commissioners of Texas have written to the Interstate Commerce Commission protesting against granting the request of Kansas millers for a reduction in the freight rates on flour from Kansas to Texas points. At present the rates on flour are about 5 per cent. higher than those on wheat, and the Kansas millers want this difference abolished. The protest states that with the understanding that the differential was to be a lasting one, a number of mills have been built in Texas that would have to close were any change made in the present rate.

The Board of Trade of Quebec has issued a circular setting forth the advantages of that port over Montreal, for import and export business by large steamers. It is stated that above Quebec large steamers frequently run aground; that navigation up to Quebec is perfectly safe at any time; that Quebec has a circuit of fully 20 miles of safe and easy anchorage; that it can accommodate the largest fleet of vessels afloat; that it is equipped with wharves, piers and docks; that at the lowest tide level a depth varying from 30 to 60 ft. can be found alongside the wharves, and that the facilities for handling and forwarding freight of any description cannot be excelled. It is pointed out that steamers can reach Quebec about one month before the opening of navigation to Montreal, and could leave Quebec in the fall nearly three weeks later than from Montreal.

The wholesale merchants of St. Louis have formed an association similar to that lately started in New York, for the purpose of securing reduced railroad fares for retail merchants coming to that city to buy goods. The President of the Association is Benjamin J. Strauss and the Secretary John A. Lee. The association acts in harmony with the Merchants' Transportation Association. The objects of the organization, which we have briefly stated, are set forth in the constitution more elaborately (somewhat after the style of a G. P. A.) as follows:

"The diffusion of knowledge among its members, the cultivation of social qualities, the building up of valuable acquaintanceships and the bringing together at certain stated periods during the year of its members for

the consideration and discussion of subjects of important educational and commercial interests, the bringing together of wholesale and retail merchants and manufacturers for the purpose of adopting plans and methods for their mutual benefit and for the public welfare."

Lake Superior Grain.

Navigation on the great lakes this year will be prolonged later into the winter than ever before. About 25 vessels were due at Duluth this week to load grain, and at Fort William, the Lake Superior port of the Canadian Pacific, 14 ships were due to arrive. It is not expected that the last cargoes will be out of the upper lakes before Dec. 15, as there is much delay at docks and in harbors on account of the ice. Ice-breaking boats are constantly at work in the harbors, and will be used in the channels connecting lakes Superior and Huron. Most of this grain is destined for direct export, but a considerable share of it will go to Chicago. As high as 5 cents a bushel has been paid to Buffalo. At this rate the large new ships can earn \$10,000 or more each trip.

Minnesota Timber.

The amount of pine timber to be cut in the forests of Minnesota during the present winter will probably be about double that of last winter. The Mississippi River cut, destined for the mills at Minneapolis, for two or three small milling centers above that city, and for points down the stream as far as Clinton, Ia., was last winter about 240 million feet. This winter, according to the estimates of the office of the surveyor general, the total will not be far from 550 million feet. In the Red Lake County, where there has been but little lumbering in preceding years, this year's total will be about 150 million feet. The Duluth district will cut not far from 500 million feet, and the St. Croix River about 350 million feet. This makes over 1,500 million feet of pine to be cut during the winter. Of the cut in the Minneapolis district 175 million will be hauled out by railroads, and in the Duluth district the railroad logging will amount to nearly the same. The number of men required to do this cutting is about 20,000.

Lake Superior Ore Shipments.

Shipments of iron ore for the year from the Lake region have ceased, with a total of about 12,000,000 tons, almost 2,000,000 more than the preceding year. The different ports have shipped as follows: Two Harbors, Minn., 2,650,000; Duluth, Minn., 2,370,000; Superior, Wis., from Minnesota ranges, 532,000; total Minnesota, 5,552,000 gross tons; Ashland, Wis., chiefly from Michigan range, 2,070,000; Marquette, Mich., 2,000,000. Escanaba and Gladstone, Mich., 2,400,000. The mines of the region are preparing for increased shipments next year that will make a total of not far from 15,000,000 tons, and are now hoisting ore with that amount in view. As showing how the center of the ore trade has moved of late years, it is interesting to note that the large dock of the Chicago & Northwestern road at Escanaba, burned the other day, will probably not be replaced; but two large docks are being built at the head of Lake Superior and one at Ashland will be materially enlarged.

Chicago Traffic Matters.

CHICAGO, Dec. 8, 1897.

Passenger rates between Chicago and St. Paul are to be restored to \$11.50 (full tariff) on Dec. 11. While the war was on the rate went as low as \$7.

The interchangeable mileage ticket of the Central Passenger Association roads is selling much better than was expected. Since it was placed on sale the sales have averaged 465 tickets a day, including Sundays.

The eastbound freight rate situation continues to go from bad to worse, the meeting of the trunk line presidents in this city last week to brace things up having done no good. Rates are at present in worse shape than they have been for several months, and it is freely admitted on all sides that the grain tariffs must suffer a reduction inside of the next few days.

Freight rates from Chicago to Colorado points were reduced twice during the last week. The first cut brought the first-class rate down to 87 cents and the last one to 80 cents, the second class rate going to 65 cents. Reductions on the other classes were not made as the rates had already reached the Missouri River basis.

The roads in the Western Passenger Association have agreed to an absolute maintenance of passenger rates in all the territory between Chicago and the Rocky Mountains. Thirty-one roads are parties to the compact. The eastbound steamship business is exempted from the agreement on account of the competition of the Soo line. The transcontinental lines are to meet in St. Louis on Dec. 14 for the purpose of reorganizing the old transcontinental passenger association.

Efforts to reorganize the Southwestern Passenger Association have failed for the reason that the Missouri, Kansas & Texas refused to become a member of any association that provides for the purchase of tickets from brokers for any purpose except a test of the market.

The Wabash road, which is a party to the interchangeable credit system of the Western Passenger Association, is causing some trouble by using the "credentials" over its entire line including points in Central Passenger territory.

The rail and across lake lines have entered into an agreement to maintain full tariff rates between Chicago and Michigan points.

Chairman Caldwell, of the Western Passenger Association, reports that the new interchangeable credit system is being well received; it has come into general use and has almost entirely superseded the regular one and two thousand mile tickets.

Eastbound shipments from Chicago and Chicago junctions to points at and beyond the western terminus of the trunk lines for the week ending Dec. 2 amounted to 70,514 tons, as compared with 55,964 tons the preceding week. This statement includes 22,846 tons of grain, 2,681 tons of flour and 18,118 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	WEEK ENDING Dec. 2.		WEEK ENDING Nov. 25.	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio.....	5,606	7.9	4,984	8.9
C. & C. & St. Louis.....	3,713	5.3	4,086	7.3
Erie.....	7,754	11	7,501	13.4
Grand Trunk.....	4,438	6.3	3,226	5.8
L. S. & M. S.....	7,067	10	5,054	9.
Michigan Central.....	7,255	10.3	7,890	14.
N. Y., Chi. & St. L.....	5,262	7.4	4,890	8.7
Pitts., Cin. & St. Louis.....	9,218	13.1	6,270	11.2
Pitts., Ft. Wayne & Chicago.....	14,512	20.6	8,589	15.4
Wabash.....	5,689	8.1	3,464	6.2
Totals.....	70,514	100.0	55,964	100.0

Lake shipments last week were 135,400 tons.